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ANNOTATED BIBLIOGRAPHY OF PENNSYLVANIA GEOLOGY— SUPPLEMENT TO 1979

by Staff
Pennsylvania Geological Survey
Annotations by Sandra Blust

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
OFFICE OF RESOURCES MANAGEMENT
BUREAU OF
TOPOGRAPHIC AND GEOLOGIC SURVEY
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PENNSYLVANIA GEOLOGICAL SURVEY

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ANNOTATED BIBLIOGRAPHY OF PENNSYLVANIA GEOLOGY— SUPPLEMENT TO 1979

INTRODUCTION

This bibliography is a continuation of the series that includes the *Annotated Bibliography of Pennsylvania Geology to 1949,* the *Annotated Bibliography of Pennsylvania Geology—Supplement to 1959,* and the *Annotated Bibliography of Pennsylvania Geology—Supplement to 1969,* published by the Pennsylvania Geological Survey as General Geology Reports 34, 42, and 61, respectively. This supplement contains citations, annotations, and indexing of articles dated from 1970 to 1979, and articles dated prior to 1970 that were not included in the earlier bibliographies.

The articles were indexed by county, subject, and geological age, where applicable. If the geographic area involved was larger than a county, other

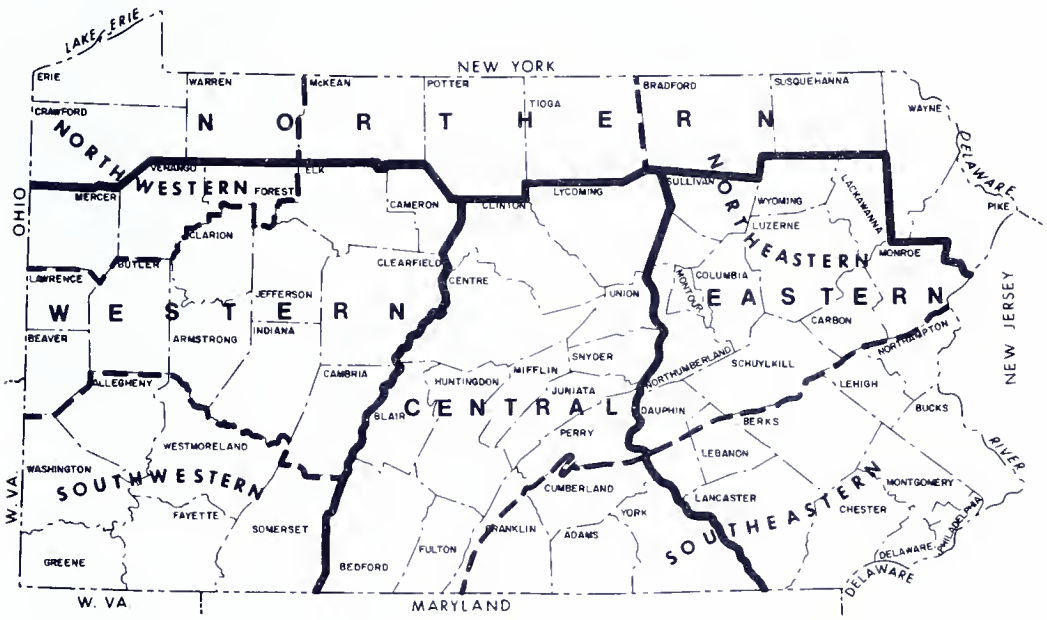

Figure 1. Geographic subdivisions of the Commonwealth used for indexing.

subdivisions of the Commonwealth were used; these are outlined in Figure 1. Each county and other subdivision of the Commonwealth is further indexed by geological subheadings.

Many of the annotations in this bibliography contain material taken directly from the abstracts, introductions, or conclusions of the reports being annotated.

Senior, Bachelor's, M.S., M.A., M.Ed., D.Ed., and Ph.D. theses from colleges and universities in the United States that contain data from the Commonwealth are included, but are not annotated. Similarly, abstracts are included if they contain data from the Commonwealth, but are not annotated. Open-file reports are also included but generally are not annotated due to their inaccessibility for examination.

The assistance of Donna Artzerounian, Robin Koeberle, and Pasquale Pontoriero, student interns, who helped to locate and annotate articles, is gratefully acknowledged.

Readers are encouraged to notify the State Geologist of any articles omitted in this bibliography and in General Geology Reports 34, 42, and 61 so that they may be included in later supplements.

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2. (and Gold, D. P., Parizek, R. R., Kowalik, W. S., Weinman, B. L., and Baumgardt, D. R.). Application of Skylab data to selected geologic and natural resource problems in Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 56, no. 6, p. 348, **1975.**
3. Seismic monitoring to learn more about eastern U.S. earthquakes: Earth and Mineral Sciences, v. 48, no. 6, p. 41, 45–47, illus., **1979.** A seismic network was established at University Park to monitor and learn more about earthquake activity in Pennsylvania and surrounding states. The monitoring network is described and background information is provided.
4. (and Abriel, W. L.). Identification of tectonically active features from combined use of remote sensing and seismic observations [abs.], *in* Podwysocki, M. H., and Earle, J. L., eds., Proceedings of the Second International Conference on Basement Tectonics [Newark, Del., 1976]: Denver, Colo., Basement Tectonics Committee, p. 594, **1979.**

See also Cybriwsky, Zenon A., 1; Gold, David P., 2, 3, 5; Lavin, Peter M., 1.

ALEXANDER, T. B., *see* Cortis, S. E., 1.

ALLDREDGE, J. R., *see* Bolstad, D. D., 1.

ALMES, R. G., *see* Palmer, E. C., 1.

ALTER, ARTHUR T.

1. Floods on Schuylkill River from Conshohocken to Philadelphia, Pennsylvania: U.S. Geological Survey Hydrologic Investigations Atlas HA-248, scale 1:16,000, **1967.** Hydrologic data are presented on the extent, depth, and frequency of flooding on the Schuylkill River.

ALTERMAN, INA B.

1. Structure and tectonic history of the Taconic allochthon and surrounding autochthon, east-central Pennsylvania: New York, Columbia University, Ph.D. thesis, **1972;** [abs.], Dissertation Abstracts International, v. 34, no. 6, p. 2706B-2707B, **1973.**
2. Rotation and dewatering during slaty cleavage formation: some new evidence and interpretations: Geology, v. 1, no. 1, p. 33-36, illus., **1973.** Microstructures in the Martinsburg Formation support the theory that the slaty cleavage formed during deformation of unconsolidated sediments by rotation of phyllosilicate grains in a loosely compacted sedimentary succession held open by abnormally high pore-fluid pressures.
3. Tectonic events in and around the eastern end of the Hamburg klippe, east-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, **1973.**

ALVORD, DONALD C.

1. (and Drake, A. A., Jr.). Geologic map of the Bushkill quadrangle [Monroe County], Pennsylvania-New Jersey: U.S. Geological Survey Geologic Quadrangle Map GQ-908, scale 1:24,000, **1971.** The Ordovician to Upper Devonian bedrock geology of the area is depicted.

AMACHER, M. C., *see* Baker, D. E., 1.

AMATO, R. V., *see* Russell, O. R., 1.

AMENTA, RODDY V.

1. Sequence of deformation and metamorphism near Philadelphia [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 10, **1970.**
2. Multiple deformation and metamorphism from structural analysis in the eastern Pennsylvania Piedmont: Geological Society of America Bulletin, v. 85, no. 10, p. 1647-1660, illus., **1974.** The structural and metamorphic events of the Wissahickon Formation near Philadelphia are reported.
3. Relative timing between deformation and metamorphism in the Wissahickon Formation near Philadelphia, *in* Amenta, R. V., and others, Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, p. 10-13, illus., **1974.** The Wissahickon Formation exhibits a variety of diachronous minor structures consisting of folds, cleavage, and lineations. The sequential development of the structures has been established and is reviewed.
4. (and Crawford, M. L., Crawford, W. A., Fergusson, W. B., Parrott, W. R., Jr., Roberts, F. H., Trojan, E. J., and Wagner, M. E.). Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, 104 p., illus., **1974.** This two-day field trip had 12 stops at sites that exhibited a variety of diachronous structures. The Glen Mills quarry (Delaware County) and the Bridgeport quarry (Montgomery County) were visited.

ANDERSON, EDWIN J., *see* Barwis, John H., 1; Goodwin, Peter W., 2, 3, 4; Makurath, Joseph H., 2.

ANDERSON, J., *see* Nejib, U. R., 1.

ANDERSON, R. Y., *see* Nuhfer, E. B., 1.

ANDERSON, T. O., *see* Komar, C. A., 1.

ANDREUZZI, FRANK C.

1. Reclaiming strip-mined land for recreational use in Lackawanna County, Pa.—a demonstration project: U.S. Bureau of Mines Information Circular 8718, 21 p., illus., **1976.** Development of a park prototype with facilities for outdoor recreational activities, picnics, and camping, as well as an anthracite museum, is discussed.

ANDREWS, JOE A.

1. (and Wetmore, R. F., Jr.). The geology of the Peach Bottom fold, Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1972.**

ANDREWS, RICHARD O.

1. (and Myer, G. H.). Radiometric analysis of a pegmatite terrain, Coatesville-Wagontown [Chester County], Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 1, **1979.**

ANGERMAN, THOMAS W., *see* Merritt, Gary L., 3.

ANNÉ, MARTIN L.

1. Brief history of Pennsylvania mineralogy, *in* Smith, R. C., II, The mineralogy of Pennsylvania, 1966–1975: Friends of Mineralogy, Pennsylvania Chapter, Special Publication 1, p. 10–17, illus., **1978.** The growth of the science of mineralogy in Pennsylvania is described, starting with the founding of the Chemical Society of Philadelphia in 1792.
2. (and Schmerling, Don). "A quarry without minerals": Rocks and Minerals, v. 53, no. 3, p. 91–93, illus., **1978.** The presence of 20 minerals has been confirmed for Kline's quarry (York County).

ANTHRACITE RESEARCH AND DEVELOPMENT COMPANY, INC.

1. Rausch Creek watershed mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 112, 86 p., 13 p. appendix [no date]. This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. Part III, Swatara Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project 126–3, pt. 3, 113 p., variously paginated appendix, illus. **[1970?].** See annotation in entry 1 above.

APGAR, MICHAEL A.

1. (and Langmuir, Donald). Ground-water pollution potential of a landfill above the water table, *in* National Ground Water Quality Symposium, Proceedings, v. 1: Ground Water, v. 9, no. 6, p. 76–96, illus., **1971;** U.S. Environmental Pro-

tection Agency Water Pollution Control Research Series 16060 GRB 08/71, p. 76-96, illus., **1971** [not seen].

APPLIN, KENNETH R.

1. Ground water geochemistry as a prospecting tool for uranium deposits in Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1978.**
2. (and Langmuir, Donald). Ground water geochemistry as a prospecting tool for uranium deposits in Pennsylvania: U.S. Department of Energy Report GJO-1659-4 (GJBX-132-78), 145 p., illus., **1978.** The use of groundwater chemistry as an exploration technique for uranium is evaluated, and this approach is compared to other more common exploration methods.

ARCHER, B., *see* Tillman, James E., 1.

ARKLE, THOMAS, JR.

1. (field trip director). Guidebook, 1. C. White Memorial Symposium Field Trip, September 27-29, 1972: West Virginia Geological and Economic Survey, 79 p., illus., **1972.** This field trip through the Dunkard basin covers an area from northeastern West Virginia into southwestern Pennsylvania and eastern Ohio. Detailed descriptions of each of the 41 stops are included in the road log.
2. Stratigraphy of the Pennsylvanian and Permian Systems of the central Appalachians, *in* Briggs, Garrett, ed., Carboniferous of the southeastern United States: Geological Society of America Special Paper 148, p. 5-29, illus., **1974.** The distribution of a series of approximately synchronous rock types in the bituminous coal fields, suggesting tectonic control, is shown in a series of isopachous and diagrammatic facies maps and cross sections.

ARMBRUSTER, JEFFREY T.

1. An infiltration index useful in estimating low-flow characteristics of drainage basins: Journal of Research of the U.S. Geological Survey, v. 4, no. 5, p. 533-538, illus., **1976.** An infiltration index that characterizes the regolith in the Susquehanna River basin provides an improved estimate of low flow. Drainage area and mean annual precipitation figures are also considered significant factors.
2. Technical manual for estimating low-flow frequency characteristics of streams in the Susquehanna River basin: U.S. Geological Survey Water-Resources Investigations 76-51, 51 p., illus., **1976.** Multiple-regression techniques are defined and utilized for estimating low-flow frequency characteristics for streams in the Susquehanna River basin.
3. Flow routing in the Susquehanna River basin: Part 1—Effects of Raystown Lake on the low-flow frequency characteristics of the Juniata and lower Susquehanna Rivers, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 77-12, 35 p., illus., **1977.** The analyses presented in this report summarize the channel and reservoir models developed, calibrated, and used to generate 17 water years of daily streamflow data that were subsequently analyzed and compared with observed streamflow data.
4. Flow routing in the Susquehanna River basin: Part III—Routing reservoir releases in the Tioga and Chemung Rivers system, Pennsylvania and New York: U.S. Geological Survey Water-Resources Investigations 79-85, 34 p., illus., **1979.** Channel routing models were used to route three hypothetical releases from reservoirs in the upper Tioga River basin. The accuracy of the estimated releases through use of the models was considered good.
5. Regional stochastic generation of streamflows using an ARIMA (1, 0, 1) process and disaggregation: U.S. Geological Survey Water-Resources Investigations 79-3,

54 p., illus., **1979.** The ARIMA model was used to create annual flow sequences at three sites in the Juniata River basin in order to better define the long-duration low-flow frequency characteristics of the basin.

See also Chen, Cheng-lung, 1.

ARMSTRONG, WILLIAM

1. Bedrock contour and glacial drift in the Geneva quadrangle, Crawford County, Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1974.**

ARNDT, HAROLD H.

1. Geologic map of the Ashland quadrangle, Columbia and Schuylkill Counties, Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ-918, scale 1:24,000, **1971.** This map of a quadrangle in the Western Middle Anthracite coal field depicts geologic units ranging from Late Devonian to Pennsylvanian in age.
2. Geologic map of the Mount Carmel quadrangle, Columbia, Northumberland, and Schuylkill Counties, Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ-919, scale 1:24,000, **1971.** The mapped area, which includes rocks of Silurian to Late Pennsylvanian age, is in the Western Middle Anthracite coal field. A stratigraphic section is included.
3. (and Wood, G. H., Jr., and Schryver, R. F.). Geologic map of the south half of the Shamokin quadrangle, Northumberland and Columbia Counties, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-734, scale 1:24,000, **1973.** The basic geology and structure of this part of the Western Middle Anthracite coal field, along with a stratigraphic section of exposed rocks of Devonian to Pennsylvanian age, are depicted.

See also Wood, Gordon H., Jr., 7.

ASHBURNER, CHARLES A. (1854-1889)

1. Progress of the Second Geological Survey of Pennsylvania: Engineers' Club of Philadelphia Proceedings, v. 2, no. 2, p. 108-114, **1881.** The status of the work of the Second Survey to 1881 is reported. Forty-two counties have been completely surveyed, and 18 more are partially completed. Reports for 28 counties and 16 special reports have been published, and several reports are in preparation.
2. Notes on the publications of the Second Geological Survey of the anthracite coal fields of Pennsylvania: Engineers' Club of Philadelphia Proceedings, v. 3, no. 3, p. 169-171, **1882.** The first published maps and sections of the anthracite area are announced. These include mine maps showing structure contours, topographic maps, cross sections, and columnar sections. The work is based on surveys by the coal operators that were corrected and extended through field work by the Pennsylvania Geological Survey.
3. New method for estimating the contents of highly plicated coal beds as applied to the anthracite fields of Pennsylvania: Engineers' Club of Philadelphia Proceedings, v. 3, no. 4, p. 216-231, **1883.** This is the first method developed to calculate anthracite reserves using the area of the coal basin, structure of the basin, and cross sections and columnar sections showing the thicknesses of the minable coals. Maps are drawn at a scale of 800 feet to the inch, and vertical cross sections are drawn perpendicular to the basin axis and equal distances apart.

ASSOCIATION OF EARTH SCIENCE EDITORS

1. Association of Earth Science Editors—Field trip, November 17, 1975: Association of Earth Science Editors, Annual Meeting, Hershey, Pa., Guidebook, 6 p., illus., **1975** [not seen].

ASSOCIATION OF ENGINEERING GEOLOGISTS

1. Engineering geology in northeastern Pennsylvania and New Jersey—Field trip no. 2: Association of Engineering Geologists, 1970 Annual Meeting, Guidebook, 32 p., illus., **1970** [not seen].

AVERITT, PAUL

1. Stripping-coal resources of the United States—January 1, 1970: U.S. Geological Survey Bulletin 1322, 34 p., illus., **1970.** Pennsylvania has been a major producer of strip-mined coal for many years. During the late 1960's, strip-mine production declined in Pennsylvania, reaching a low of 25 million short tons in 1968. Published reports that deal with stripping-coal resources are discussed in a summary paragraph.
2. Coal resources of the United States, January 1, 1974: U.S. Geological Survey Bulletin 1412, 131 p., illus., **1975.** The coal reserves ("identified and hypothetical resources remaining in the ground") of the United States as of January 1, 1974, were estimated at 3,968 billion tons. Pennsylvania was estimated to have about 90 billion tons of coal in reserves.

BAGANZ, B. P., *see* Ferm, John C., 7; Horne, John C., 1.

BAIER, E.

1. (and Rigotti, P. A., and Schmidt, V. A.). Paleointensities from Upper Triassic and Lower Jurassic intrusives from the northern Appalachians [abs.]: EOS (American Geophysical Union Transactions), v. 59, no. 4, p. 271, **1978.**

BAILEY, ALAN

1. Chemical and mineralogical differences between the northwest and southeast outcrop areas of the Lower Kittanning coal zone—West Virginia, Ohio and Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 382, **1979.**

BAILEY, J. F.

1. (and Patterson, J. L., and Paulhus, J. L. H.). Hurricane Agnes rainfall and floods, June-July 1972: U.S. Geological Survey Professional Paper 924, 403 p., illus., **1975.** The detailed life history of the storm is traced and rainfall information shown for selected sites on the Susquehanna River.

BAILEY, R. C.

1. (and Edwards, R. N.). Crustal electrical conductivity structure in the eastern U.S.: new results [abs.]: EOS (American Geophysical Union Transactions), v. 59, no. 12, p. 1036, **1978.**

BAILEY, S. W., *see* Guggenheim, Stephen, 1.

BAIN, G. L., *see* Lloyd, Orville B., Jr., 1.

BAIR, E. SCOTT

1. Permeability distribution in surficial glacial outwash revealed by a shallow geothermal prospecting technique: University Park, Pennsylvania State University, M.S. thesis, **1976.**
2. (and Parizek, R. R.). Detection of permeability variations by a shallow geothermal technique: Ground Water, v. 16, no. 4, p. 254-263, illus., **1978.** During a

seven-month period, surface-water, groundwater, and shallow subsurface temperatures were measured at a well field in the Coastal Plain province in southeastern Pennsylvania in an attempt to delineate zones of relatively greater permeability in the underlying glacial outwash materials.

3. (and Parizek, R. R.). Hydrogeologic ramifications of open-pit anthracite mining [abs.]: Ground Water, v. 17, no. 5, p. 493–494, **1979.**

BAIRD, DONALD

1. Studies on Carboniferous freshwater fishes: American Museum Novitates, no. 2641, 22 p., illus., **1978** [not seen].
2. Rare fossil fish surfaces at the William Penn Memorial Museum: Pennsylvania Geology, v. 10, no. 2, p. 12–16, illus., **1979.** Examination of the fossil collections of the Second Geological Survey revealed a rare fossil, the coelacanth *Latimeria chalumnae.*

BAKER, D. E.

1. (and Amacher, M. C., and Doty, W. T.). Monitoring sewage sludges, soils and crops for zinc and cadmium, *in* Loehr, R. C., ed., Land as a waste management alternative—Proceedings of the 1976 Cornell Agricultural Waste Management Conference: Ann Arbor, Mich., Ann Arbor Science Publications, p. 261–281, illus., **1977** [not seen].

BAKER, DONALD R.

1. (and Claypool, G. E.). Effects of incipient metamorphism on organic matter in mudrock: American Association of Petroleum Geologists Bulletin, v. 54, no. 3, p. 456–468, illus., **1970.** Research supports the idea that degrees of incipient metamorphism may be recognized and classified based on the composition of the organic matter in sedimentary rocks. Some rock samples used were collected from the Martinsburg Formation in southeastern Pennsylvania.

BAKER, E. T., *see* Stingelin, Ronald W., 2.

MICHAEL BAKER, JR., INC.

1. Acid mine drainage survey, East Branch Clarion River watershed, Elk and McKean Counties: Pennsylvania Department of Mines and Mineral Industries, Operation Scarlift Project SL 108, variously paginated, illus., **1970.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. (and The Pennsylvania State University, Institute of State and Regional Affairs). Subsidence and mining related problems—Summary of research program: Appalachian Regional Commission Report ARC-73-163-2559-S, 23 p., illus., **1977.** A comprehensive approach to risk assessment, subsidence-mitigation options, subsidence prevention, and application of the plan to the Pennsylvania anthracite region are discussed. A synopsis of each of 10 contributory studies is also included.
3. Blacklick Creek watershed mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 185, 153 p., variously paginated appendix, illus., **1978.** See annotation in entry 1 above.

BALASCO, CHARLES, *see* Gillespie, William H., 1.

BALCH, EDWIN S.

1. The Coudersport freezing cave: Scientific American, v. 114, p. 663, **1916** [not seen].
2. The Coudersport ice mine: American Philosophical Society Proceedings, v. 60, no. 4, p. 553–559, **1921** [not seen].
3. Glacières or freezing caverns [with a new introduction by William R. Halliday]: New York, Johnson Reprint Corporation, 337 p., **1970** [reprinted from *Glacières or freezing caverns,* Philadelphia, Allen, Lane and Scott, 337 p., 1900]. Includes discussions of European and American occurrences of ice caves (mines) and their origins, with specific reference to five Pennsylvania localities. The reprint also includes an introductory review of Balch's life, a list of his publications, and several additional references.

BALOGH, LAJOS J., *see* Kelley, Dana R., 7; Lytle, William S., 20, 26.

BANERJEE, S. K., *see* King, John, 1.

BANKS, HAROLD, *see* Haefner, Richard, 2.

BANNISTER, EVERETTE N.

1. Topographic potential energy and channel development on engineered slopes in unconsolidated backfill [Eau Claire, Butler County]: University of Pittsburgh, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 38, no. 4, p. 1628B, **1977.**

BARBER, J.

1. A study of the magnetic Martic Line near Harmony Hill, Chester County, Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1977.**

BARKER, JAMES L.

1. An evaluation of the use of herbicides to control aquatic weeds in six Pennsylvania recreation lakes, *in* Geological Survey research 1972, Chapter C: U.S. Geological Survey Professional Paper 800-C, p. C221–C232, illus., **1972.** The application of the herbicides diquat, Kuron, and Aquathol Plus to one third or less of the surface areas of six recreational lakes was found to have no serious effects on the environments of the lakes.
2. Effects of air injection at Prompton Lake, Wayne County, Pennsylvania: Journal of Research of the U.S. Geological Survey, v. 4, no. 1, p. 19–25, illus., **1976.** The effects of destratification and aeration on the algae, physiochemical properties, and nutrients of Prompton Lake were measured following injection of compressed air.
3. (and Kulp, K. P.). Limnological survey of Sacony Creek basin, Berks County, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 76–84, 39 p., illus, **1976.** The results of a detailed limnological survey of Sacony Creek basin are presented. Good- to excellent-quality water was found.
4. Water-quality study of Tulpehocken Creek, Berks County, Pennsylvania, prior to impoundment of Blue Marsh Lake: U.S. Geological Survey Water-Resources Investigations 77–55, 59 p., illus., **1977.** The water quality of Tulpehocken Creek, prior to impoundment, was investigated through sampling of water, bed material, and soil.
5. Bacteriological water quality of Tulpehocken Creek basin, Berks and Lebanon Counties, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 78–53, 25 p., illus., **1978.** Fecal contamination affecting the water quality of the basin was predicted to improve by impoundment of Blue Marsh Lake.

6. Characteristics of Pennsylvania recreational lakes: Pennsylvania Department of Environmental Resources, Office of Resources Management, Water Resources Bulletin 14, 226 p., illus., **1978.** The results of limnological surveys of 53 impoundments throughout Pennsylvania are presented. Map locations for each lake are included as well as descriptions of their physical and morphological features, chemical and biological characteristics, and dissolved oxygen-temperature profiles.
7. Water-quality investigation of Francis Slocum Lake, Luzerne County, Pennsylvania: U.S. Geological Survey Open-File Report 78-819, 12 p., illus., **1978.** A summary of water-quality data collected in the drainage basin of Francis Slocum Lake from October 1976 to September 1977.

See also Ott, A. N., 1; Wood, Charles R., 1.

BARLOW, JAMES A., *see* Darrah, William C., 3.

BARNES, JOHN H.

1. (and Lapham, D. M.). Rare minerals found in Pennsylvania: Pennsylvania Geology, v. 2, no. 5, p. 6-8, illus., **1971.** Rare mineral specimens such as salammoniac, cryptohalite, bararite, and mascagnite, obtained from Kehley's Run mine in Schuylkill County, are discussed. Other states and countries where the minerals have been found are also mentioned.
2. (and Lapham, D. M.). Selenium: Pennsylvania's rarest mineral?: Pennsylvania Geology, v. 3, no. 2, p. 8-9, illus., **1972.** Native selenium is one of the newest and most unusual additions to the list of Pennsylvania minerals. The discoveries were made in Luzerne and Dauphin Counties.
3. Lake Erie reaches record high level: Pennsylvania Geology, v. 4, no. 3, p. 2-4, illus., **1973.** Record high water levels occurred in Lake Erie during 1972.
4. Three new minerals for Pa.: Pennsylvania Geology, v. 4, no. 4, p. 30-31, **1973.** Three new minerals—langite, posnjakite, and hexahydrite—have been added to the list of minerals found in Pennsylvania.
5. Chlorite group, *in* Smith, R. C., II, The mineralogy of Pennsylvania, 1966-1975: Friends of Mineralogy, Pennsylvania Chapter, Special Publication 1, p. 76-90, illus., **1978.** Ten chlorite samples from eight southeastern and south-central localities are discussed.

See also Finkelman, Robert B., 1; Geyer, Alan R., 11; Lapham, Davis M., 8, 16; O'Neill, Bernard J., Jr., 8; Smith, Robert C., II, 24.

BARSOTTI, NINO J., *see* Dougherty, Murray T., 1.

BARWIS, JOHN H.

1. (and Anderson, E. J.). Evolution of a regressive sand: the Oriskany Formation (Lower Devonian) of northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 1-2, **1972.**
2. Sedimentology and paleoenvironments of the Oriskany Group of eastern Pennsylvania: Philadelphia, Temple University, M.S. thesis, **1973.**
3. (and Goodwin, P. W.). Modern and ancient examples of annelid burrows as current-direction indicators [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 3, p. 415, **1979.**

BASKIN, LEON

1. Linear relationship between mine flow-acid load and influence of depositional environment, *in* Underground Coal Mining Symposium: New York, McGraw-Hill, p. 121-137, illus., **1979** [not seen].

BASU, DEBABRATA

1. Genesis of the Grace mine magnetite deposit, Morgantown, Berks County, southeastern Pennsylvania: Bethlehem, Pa., Lehigh University, Ph.D. thesis, **1974**; [abs.], Dissertation Abstracts International, v. 35, no. 11, p. 5488B–5489B, **1975.**
2. (and Sclar, C. B.). Genesis of the Grace mine magnetite deposit, Morgantown, Berks County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 769–770, **1976**; Economic Geology, v. 72, no. 4, p. 725, **1977.**

BATES, ROBERT L.

1. Sub-Trenton structure of Ohio, with views on isopach maps and stratigraphic sections as basis for structural myths in Ohio, Illinois, New York, Pennsylvania, West Virginia, and Michigan: discussion: American Association of Petroleum Geologists Bulletin, v. 59, no. 5, p. 878–879, **1975.**

BAUCOM, E. I., *see* Price, Van, 1.

BAUER, JOHN W.

1. Base and total stream flow variability in carbonate basins: University Park, Pennsylvania State University, M.S. thesis, **1969.**

BAUMGARDT, D. R., *see* Alexander, Shelton S., 2.

BEALL, ROBERT M.

1. Historic and June 1972 flood elevations, Greater Pittsburgh Region [Allegheny, Armstrong, Beaver, Butler, Washington, and Westmoreland Counties], Pennsylvania: U.S. Geological Survey Open-File Report, 10 p., map, **1972.** The six-county area in southwestern Pennsylvania experienced flooding from tropical storm Agnes and from other historic storms which are reviewed.
2. (and Lardieri, A. C.). Status of flood-plain mapping, Greater Pittsburgh Region [Allegheny, Armstrong, Beaver, Butler, Washington, and Westmoreland Counties], Pennsylvania, 1972: U.S. Geological Survey Open-File Report, 16 p., illus., **1972.** The extent of flood-mapping activities and the coverage of floodplain-information reports in the six-county area are shown.
3. Map showing areas serviced by public water-supply agencies in 1973, Greater Pittsburgh Region [Allegheny, Armstrong, Beaver, Butler, Washington, and Westmoreland Counties], southwestern Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-607, scale 1:125,000, 2 sheets, **1974.** The map and tabular data provide general information on the water-supply systems in the six-county area, including numbers of users and total consumption.
4. Stream reconnaissance for nutrients and other water-quality parameters, Greater Pittsburgh Region [Allegheny, Armstrong, Beaver, Butler, Washington, and Westmoreland Counties], Pennsylvania: U.S. Geological Survey Water-Resources Investigations 50–74, 64 p., **1975** [not seen].
5. Guide to the availability of hydrologic data, Greater Pittsburgh Region [Allegheny, Armstrong, Beaver, Butler, Washington, and Westmoreland Counties], Pennsylvania: U.S. Geological Survey Open-File Report 76–352, 22 p., illus., **1976.** Active primary-data-collection sites have been located on a map and the sources of data described.
6. Mean annual runoff in the upper Ohio River basin, 1941–70, and its historical variation: U.S. Geological Survey Water-Supply Paper 2042, 32 p., illus., **1978.**

The primary data base consists of records from 98 long-term gaging stations supplemented by 83 short-term records. Ratios of mean annual runoff to the 30-year reference period were computed for all long-term stations, and summaries of the annual ratios are graphed.

See also Coll, M. B., Jr., 1.

BEBEL, DENNIS J., *see* Thompson, Allan M., 7.

BECHER, ALBERT E.

1. Ground water in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Educational Series 3, 42 p., illus., **1970.** Principles of groundwater occurrence and movement, mechanics of effective groundwater development through wells, and groundwater availability throughout the Commonwealth are discussed.
2. (and Meisler, Harold). High-calcium limestone deposits in Lancaster County, southeastern Pennsylvania, *in* Geological Survey research 1970, Chapter B: U.S. Geological Survey Professional Paper 700-B, p. B102-B104, illus., **1970.** Geologic mapping in the Lititz quadrangle, in the Conestoga Valley section of the Piedmont province, revealed the presence of the Annville Limestone, a commercially valuable high-calcium limestone that was reported previously only in the Great Valley section of the Valley and Ridge province.

See also Meisler, Harold, 1.

BECHTEL, WILLIAM L., JR.

1. The geology of Snyder County, Pennsylvania: University Park, Pennsylvania State University, M.Ed. thesis, **1974.**

BECK, MYRL E., JR.

1. Paleomagnetism of Upper Triassic diabase from southeastern Pennsylvania: further results: Journal of Geophysical Research, v. 77, no. 29, p. 5673-5687, illus., **1972.** Seventy-eight sites in Upper Triassic diabase from southeastern Pennsylvania yielded a paleomagnetic pole at 62.0°N, 104.5°E, about 0.5 degrees from an earlier pole calculation. This distribution of poles suggests that geomagnetic secular variation during the Late Triassic consisted mainly of dipole wobble, and that there was little or no contribution from nondipole sources.

BECK, WILLIAM W., JR., *see* Russnow, Arthur L., 1.

BEERS, W. F., *see* Ciolkosz, Edward J., 1.

BELL, MAURICE E.

1. Interdisciplinary instruction and research in the College of Earth and Mineral Sciences—a quarter-century of evolution and change: Earth and Mineral Sciences, v. 42, no. 9, p. 65-69, illus., **1973.** The educational program at Pennsylvania State University is historically reviewed and the interdisciplinary-instruction trends and future outlook are discussed.

BELLANTE, CLAUSS, MILLER AND NOLAN, INC.

1. Loyalsock Creek mine drainage abatement measures, Sullivan County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 188, 133 p., illus. [no date]. This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

BELZ, DAVID J.

1. Allegheny County soils, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 93–103, illus., **1970.** Residual, colluvial, and alluvial soils of Allegheny County are described in text and tables.

See also Wagner, Walter R., 6.

BENCH, BERNARD M.

1. (and Diamond, W. P., and McCulloch, C. M.). Methods of determining the orientations of bedrock fracture systems in southwestern Pennsylvania and northern West Virginia: U.S. Bureau of Mines Report of Investigations 8217, 35 p., illus., **1977.** Photolineaments are described and compared with the trends of oriented fracture systems obtained by measuring the compass direction of joints in bedrock.

See also Diamond, W. Patrick, 1, 2; McCulloch, Charles M., 3.

BENDER, DANIEL J.

1. (and Troutman, S. E.). Hydrologic study of the Elizabethtown area: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1974.**

BENDER, J. F.

1. Regional metamorphism of pelites in southeastern Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1972.**

BENEDICT, L. G., *see* Thompson, Richard R., 1.

BENSON, DAVID C.

1. (and Doyle, F. J.). Projects to expand fuel sources in eastern states—an update of Information Circular 8725—Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of July 1977): U.S. Bureau of Mines Information Circular 8765, 141 p., illus., **1978.** An updated list of fuel-related projects in Pennsylvania.

BERDAN, J. M., *see* Copeland, Murray J., 1.

BERG, THOMAS M.

1. New fossil locality for Clearfield County: Pennsylvania Geology, v. 1, no. 9, p. 8–9, illus., **1970.** A fossil-collecting locality in Clearfield County that has at least two Mississippian plant genera, *Adiantites* and *Lepidodendropsis,* has been located. A location map and photographs of specimens are included.
2. Clam burrows in the Upper Devonian or: "Quo vadis *Archanodon*?": Pennsylvania Geology, v. 3, no. 6, p. 6–8, illus., **1972.** The fossil burrow made by an elusive clam during Late Devonian time was recognized in the Catskill Formation of northeastern Pennsylvania.
3. Faulting revealed in the northern Penfield area, Clearfield County: Pennsylvania Geology, v. 3, no. 3, p. 8–9, illus., **1972.** Geologic mapping revealed a high-angle reverse fault at the surface. Named the Mountain Run fault, it has up to 400 feet of displacement and can be traced for 7 miles.
4. Pelecypod burrows in the basal sandstone member of the Catskill Formation, northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 137, **1973.**
5. (and Sevon, W. D.). Value of color aerial photography for geologic mapping of Pike County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 6, **1974.**

6. Geology and mineral resources of the Brodheadsville quadrangle, Monroe and Carbon Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 205a, 60 p., illus. including geologic maps, **1975.** The bedrock and surficial geology of this rapidly developing region in the Pocono Mountains has been mapped, and the stratigraphy and structure are described. Attention is also given to mineral resources and environmental characteristics.
7. (and Glover, A. D.). Geology and mineral resources of the Sabula and Penfield quadrangles, Clearfield, Elk, and Jefferson Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 74ab, 98 p., illus. including geologic map, **1976.** The geologic map, sections, and tables detail the distribution and reserves of coal deposits and the locations of gas-producing wells.
8. Bivalve burrow structures in the Bellvale Sandstone, New Jersey and New York: New Jersey Academy of Science Bulletin, v. 22, no. 2, p. 1–5, illus., **1977.** The fossil burrow produced by the freshwater bivalve *Archanodon catskillensis* occurs in the upper Bellvale Sandstone of the Green Pond syncline. The burrow is identical to those found in the Towamensing Member of the Catskill Formation of northeastern Pennsylvania. The occurrence of the burrows supports the view that the upper part of the Bellvale is of nonmarine origin, and that it is homotaxial with the Towamensing. If other fossil evidence supports a Middle Devonian age, then these are burrows of the oldest known freshwater clam.
9. (and Sevon, W. D., and Bucek, M. F.). Geology and mineral resources of the Pocono Pines and Mount Pocono quadrangles, Monroe County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 204cd, 66 p., illus. including geologic maps, **1977.** The nature and occurrence of the various bedrock and surficial units are described and delineated. Mineral resources and environmental characteristics are also described.
10. (and Thoms, R. E.). Burrowing activity of *Archanodon* in the Catskill Formation, and potential of *Margaritifera* as a modern analog [abs.]: Palaeontological Association, International Symposium on the Devonian System, 1978, Abstracts, p. 19, **1978.**
11. Upper Devonian-Lower Mississippian stratigraphic relations in north-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 3, **1979.**
12. (and Edmunds, W. E.). The Huntley Mountain Formation: Catskill-to-Burgoon transition in north-central Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 83, 80 p., illus., **1979.** The stratigraphic interval in north-central Pennsylvania between the Catskill Formation and the Burgoon Sandstone is formally named the Huntley Mountain Formation. The new formation spans the Devonian-Mississippian systemic boundary and includes the clastic sequence that was formerly called "Oswayo" (below) and "lower Pocono" (above). All aspects of the new formation are discussed, and a detailed type-section description is given in the appendix.

See also Edmunds, William E., 1, 10; Sevon, William D., 12, 15, 19; Skema, Viktoras W., 1; Thoms, Richard E., 1.

BERGENBACK, RICHARD E.

1. The geochemistry and petrology of the Vanport Limestone, western Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 68–71, illus., **1979.** A synopsis of a Ph.D. dissertation in which the insoluble residues, carbon isotope ratios, and petrography of the Vanport Limestone are described and related to sedimentary environments.

See also Eason, James E., 1, 2; Weber, Jon N., 1; Williams, Eugene G., 10.

BERGER ASSOCIATES, INC.

1. Swatara Creek mine drainage pollution abatement project, Part two: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 126-2, 168 p., illus., **1972.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. (and A. B. Riedel Associates). Evaluation of mining constraints to the revitalization of Pennsylvania anthracite: U.S. Bureau of Mines Open-File Report 47-75, 375 p., illus., **1975.** Includes the location, quantity, and depth of Pennsylvania anthracite reserves as well as a discussion of the existing and potential markets.
3. Bennett Branch of Sinnemahoning Creek mine drainage abatement measures, Clearfield, Elk and Cameron Counties: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 195, variously paginated, illus., **1976.** See annotation in entry 1 above.

BERGER, HARLAN, *see* Parris, Martha, 1.

BERGER, PHILIP S.

1. (and Wheeler, R. L.). Late-tectonic extension faulting in the central Appalachians, *in* Barlow, Hilma, ed., Proceedings—Third Eastern Gas Shales Symposium [Morgantown, W. Va., 1979]: U.S. Department of Energy Report METC/SP-79/6, p. 51-61, illus., **1979.** Extension faults result in layer-parallel elongation and thinning of folded strata. Some thinning is caused by extension faulting, and some by flowage within thick shale units, rather than by splay faults from a detachment surface. Extension faults may cause fracture permeability in reservoir rocks.
2. (and Wheeler, R. L.). Sequence of outcrop-scale faulting, central Appalachians, and implications for fractured gas reservoirs [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 4, p. 171, **1979.**

BERGER, ZEEV

1. Stream adjustment to drop in base level tested through dynamic equilibrium and geomorphic threshold concepts: a case study of some of the Allegheny's tributaries: University of Pittsburgh, Ph.D. thesis, **1978;** [abs.], Dissertation Abstracts International, v. 39, no. 4, p. 1669B-1670B, **1978.**

BERGIN, MARION J.

1. Bedrock geologic map of the anthracite-bearing strata in the northwestern part of the Wilkes-Barre East quadrangle, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-753, scale 1:12,000, **1973.** Formations, specific coal seams, faults, fold axes, and strip-mined areas are shown. Cross sections, columnar sections, and a coal-bed nomenclature chart are on the same sheet.
2. Bedrock geologic map of the anthracite-bearing rocks in the Wilkes-Barre West quadrangle, Luzerne County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-838, scale 1:12,000, 2 sheets, **1976.** Includes a bedrock geologic map of part of the Northern Anthracite field, stratigraphic sections of the Llewellyn Formation, and structure sections across the report area.

See also Hosterman, John W., 1; Wood, Gordon H., Jr., 1.

BERGSTRÖM, STIG M.

1. Conodont biostratigraphy of the Middle and Upper Ordovician of Europe and eastern North America, *in* Sweet, W. C., and Bergström, S. M., eds., Symposium

on conodont biostratigraphy: Geological Society of America Memoir 127, p. 83–157, illus., **1971.** A summary paragraph is included for Pennsylvania.

2. (and Epstein, A. G., and Epstein, J. B.). Early Ordovician North Atlantic Province conodonts in eastern Pennsylvania, *in* Geological Survey research 1972, Chapter D: U.S. Geological Survey Professional Paper 800-D, p. D37–D44, illus., **1972.** The discovery of North Atlantic province conodont faunas in Early Ordovician rocks in eastern Pennsylvania and in Newfoundland is of considerable interest because it provides evidence that the striking provincial differentiation of Ordovician conodont faunas in the northern hemisphere may be traced to Early Arenigian time.

See also Epstein, Jack B., 3.

BERRY, WILLIAM B. N.

1. Review of late Middle Ordovician graptolites in eastern New York and Pennsylvania: American Journal of Science, v. 269, no. 3, p. 304–313, illus., **1970.** A review of late Middle Ordovician graptolites indicates that the zone may be divided into lower and upper subzones. Correlations resulting from this division permit greater precision in dating Taconic orogenic events in the northern part of the Appalachians.
2. (and Boucot, A. J., eds.). Correlation of the North American Silurian rocks: Geological Society of America Special Paper 102, 289 p., illus., **1970.** The lithologic and paleontologic aspects of the Silurian rocks in North America, including those in Pennsylvania, are analyzed.

See also Epstein, Jack B., 5.

BERRYHILL, HENRY L., JR.

1. (and Schweinfurth, S. P., and Kent, B. H.). Coal-bearing Upper Pennsylvanian and Lower Permian rocks, Washington area, Pennsylvania: U.S. Geological Survey Professional Paper 621, 47 p., illus., **1971.** Of the 17 coal beds exposed, only the Pittsburgh is mined commercially; however, the Waynesburg also contains sizable resources, and, as of January 1966, remaining "measured" reserves in these two beds in the Washington area totalled nearly 1.5 million tons. Other resources include sandstone and limestone used for road construction, mudstone for making brick, and some mudstone units for potential sources of lightweight aggregate.

BERTI, ALBERT A.

1. Pollen and seed analysis of the Titusville section (mid-Wisconsinan), Titusville, Pennsylvania: Canadian Journal of Earth Sciences, v. 12, no. 9, p. 1675–1684, illus., **1975.** A buried biogenic deposit from Titusville, Crawford County, was analyzed and dated as approximately 35,000 to 40,000 years old.

BERTRAND, HERVÉ

1. (and Westphal, Michel). Comparaisons géologiques et paléomagnétiques des tholéiites du Maroc et de la côte orientale de l'Amérique du Nord: implications pour l'ouverture de l'Atlantique: Société Géologique de France Bulletin, v. 19, no. 3, p. 513–520, illus., **1977.** Geochemical zonation of tholeiites was oblique to rifting direction, and those of Pennsylvania and Maryland are classified in a separate geochemical group. Tholeiites vary less by longitude than by latitude.

BEYER, L. E.

1. (and Hutnik, R. J.). Acid and aluminum toxicity as related to strip-mine spoil banks in western Pennsylvania: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report SR-72, 79 p., illus., **1969.** A substan-

tial number of stripped areas cannot be revegetated because the spoils are highly acid and some contain toxic substances.

BIENIAWSKI, Z. T.

1. Engineering rock mass classification—new aid for engineers and geologists: Earth and Mineral Sciences, v. 49, no. 1, p. 1–5, illus., **1979.** The Geomechanics Classification technique is reviewed and its application to geology demonstrated.

BIGGS, DOUGLAS C.

1. [Description of minerals collected from a vug in the Keystone quarry at Cornog, Chester County], *in* Montgomery, Arthur, Pennsylvania minerals (64): Keystone Newsletter, v. 17, no. 4, p. 8–10, **1968.**

BIKERMAN, MICHAEL, *see* Pimentel, Nelly R., 2.

BILZI, A. F.

1. (and Ciolkosz, E. J.). Time as a factor in the genesis of four soils developed in recent alluvium in Pennsylvania: Soil Science Society of America Journal, v. 41, no. 1, p. 122–127, illus., **1977.** Four soils developed in recent alluvium in the Valley and Ridge physiographic province of central Pennsylvania were studied in an attempt to relate chronologic age to pedologic age.

BINGHAM, DONALD L.

1. Flow routing in the Susquehanna River basin: Part II—Low-flow frequency characteristics of the Susquehanna River between Waverly, New York and Sunbury, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 79–52, 31 p., illus., **1979.** Six flow-routing models were developed, calibrated, and verified. The models were used to simulate a 32-year record of daily flows along the river.

BIRD, JOHN M.

1. (and Dewey, J. F.). Lithosphere plate-continental margin tectonics and the evolution of the Appalachian orogen: Geological Society of America Bulletin, v. 81, no. 4, p. 1031–1060, illus., **1970.** The Late Precambrian to Devonian history of the New England and Newfoundland segments of the Appalachian orogen was examined. The authors propose an evolution model for the Appalachian-Caledonian "Atlantic" Ocean and its system of lithosphere plates and their role in the formation of the orogen. The Appalachians of Pennsylvania are discussed in this model.

BIRX, DEBORAH

1. Pennsylvanian paleobotany of the Bernice basin, Sullivan, Wyoming, and Luzerne Counties, Penna.: Pennsylvania Geology, v. 5, no. 2, p. 11–13, illus., **1974.** Four hundred thirty-nine fossil-plant species were examined from the Bernice basin.

BITLER, JOHN R.

1. (and Martin, J. D.). Computer graphics demonstration—area coal availability studies: U.S. Bureau of Mines Information Circular 8736, 16 p., illus., **1977.** A discussion of how computer graphics techniques were used to present data on coal reserves in the eastern United States. The Upper Freeport coal in western Pennsylvania is included.

BLACKBEER, LAWRENCE E.

1. (and Feldman, H. R., and Kennish, M. J.). Modification of trace fossil systematics as applied to Conemaugh (Pennsylvanian) lebensspuren of western Pennsylvania

[abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 27–28, **1975.**

BLACKBURN, WILLIAM H.

1. (and Brown, W. R.). Petrochemical evidence relating the Catoctin volcanic series to late Precambrian continental separation [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 136–137, **1976.**

See also Davis, Philip A., Jr., 2.

BLATT, HARVEY, *see* Sibley, Duncan F., 1.

BLEIWEISS, PETER, *see* Renken, Robert A., 1.

BLUST, SANDRA

1. (compiler). Annotated bibliography of geologic field trip guidebooks of Pennsylvania to 1977: Pennsylvania Geological Survey, 4th ser., 19 p., illus., **1978.** Includes maps showing field-trip routes, and a general index by subject and county.

BOETTCHER, ANDREW J., *see* Hastings, David S., 1.

BOGDAN, D., *see* King, John, 1.

BOLLENBACHER, MARK

1. Anomalous sinuosities in Muddy Creek: Meadville, Pa., Allegheny College, Bachelor's thesis, **1975.**

BOLLES, WILLIAM H.

1. Pennsylvania leads nation: Pennsylvania Geology, v. 1, no. 1, p. 11, **1969.** Pennsylvania's enrollment in earth and space science courses on the secondary level leads the nation.
2. Sinkhole in cross section: Pennsylvania Geology, v. 1, no. 6, p. 16, illus., **1970.** A sinkhole in an exposure along Interstate Route 80 between the Mackeyville and Lamar interchanges, Clinton County, is discussed.
3. (and Lapham, D. M.). Quartz roses for your rock garden: Pennsylvania Geology, v. 1, no. 8, p. 11–12, illus., **1970.** An unusually formed quartz, having a crude rosette structure, was found near Mechanicsburg, Cumberland County.
4. Nature to produce Christmas spectacular: Pennsylvania Geology, v. 4, no. 6, p. 10–11, illus., **1973.** Comet Kohoutek was visible in the eastern United States in mid-November 1973.
5. Scranton's mineral heritage preserved: Pennsylvania Geology, v. 6, no. 6, p. 2–5, illus., **1975.** A largely pictorial view of the mineral industry in Scranton, Lackawanna County.
6. (and Geyer, A. R.). Pennsylvania Interstate 80—Geologic guide: Pennsylvania Department of Education and Pennsylvania Department of Environmental Resources, pamphlet, illus., **1975.** A nontechnical review of the most interesting aspects of the geology along Interstate Route 80 in Pennsylvania.
7. (and Geyer, A. R.). Pennsylvania Interstate 81—Geologic guide: Pennsylvania Department of Education and Pennsylvania Department of Environmental Resources, 35 p., illus., **1976.** A nontechnical review of the topography and geology along the 232-mile north-south stretch of Interstate Route 81 in eastern Pennsylvania.
8. The Meadowcroft Rockshelter—The earliest evidence of Stoneage man in North America: Pennsylvania Geology, v. 8, no. 6, p. 2–5, illus., **1977.** This anthropological dig proves that men lived in western Pennsylvania 16,000 years ago, dating them as the earliest inhabitants of North America.

9. Governor's Stables: Pennsylvania Geology, v. 9, no. 1, p. 6-7, illus., **1978.** A boulder cave in Lancaster County takes its name from a visit by Andrew Curtin, governor of Pennsylvania from 1861 to 1867.
10. A diabase dinosaur: Pennsylvania Geology, v. 10, no. 1, p. 5-6, illus., **1979.** Weathered diabase in Lebanon County resembles the head of a dinosaur.
11. Earth and space science in Pennsylvania: a twenty year perspective: Pennsylvania Geology, v. 10, no. 3, p. 9-10, **1979.** Developments in earth science education are outlined.

See also Geyer, Alan R., 14.

BOLLING, STEWART N.

1. The freeze-thaw resistance of some Pennsylvania gravel aggregates: University Park, Pennsylvania State University, M.S. thesis, **1970.**

BOLSTAD, D. D.

1. (and Alldredge, J. R., and Mahtab, M. A.). Procedures used for sampling fracture orientations in an underground coal mine: U.S. Bureau of Mines Report of Investigations 7763, 9 p., illus., **1973.** Stratified cluster sampling and the unit-area concept applied to the collection of fracture-orientation data for a study of roof behavior in Greensboro (Greene County) helped isolate sources of variability in the fracture patterns.

BORRY, BARRETT E.

1. The Newport cut slope—small scale slope failure causing rockfall, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 192-195, illus., **1978.** The problem of slope stability at the Newport roadcut, along U.S. Route 322 in Perry County, is reviewed.
2. The use of instrumentation to investigate a possible highway embankment failure near Newport, Pennsylvania, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 187-191, illus., **1978.** Two types of instrumentation—the inclinometer and the shear strip—were used to determine whether failure was likely to occur on an embankment that was observed to have an apparent "bulge" and water seepage. The advantages and disadvantages of each type are discussed.

BOSTICK, N. H., *see* Claypool, G. E., 1.

BOTTNER, ROGER W.

1. Petrology of Precambrian gneisses, Wagontown area [Chester County], Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1974.**

BOUCOT, ALBERT J., *see* Berry, William B. N., 2.

BOYER KANTZ AND ASSOCIATES

1. Babb Creek mine drainage abatement project, Tioga & Lycoming Counties, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 145-1, 126 p., illus., **1976.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

BOYER, STEVEN E.

1. Jointing in the Mifflinburg area [Union County]: Lewisburg, Pa., Bucknell University, Senior thesis, **1972.**

BOZION, C. N., *see* Heyl, Allen V., 1.

BRAGONIER, WILLIAM A.

1. Genesis and geologic relations of the high-alumina Mercer fireclay, western Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1970.**
2. (and Williams, E. G.). Genesis and geologic relations of the high-alumina Mercer fireclay, western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 13, **1970.**

See also Glover, Albert D., 2; Skema, Viktoras W., 1; Williams, Eugene G., 3, 5.

BRANT, LYNN A.

1. A study of the faunal succession in the Brush Creek Shale (Pennsylvanian), near Shelocta [Indiana County], Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1971.**

BRANT, RUSSELL A.

1. Geological problems associated with coal resources and reserves determinations in the Appalachian coal basin [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 393, **1979.**

BRANTHOOVER, GERALD L.

1. Geological engineering investigation of talus slopes in Lewistown Narrows, Pennsylvania: Annual Highway Geology Symposium, 23rd, Proceedings, p. 11–31, illus., **1972** [not seen].
2. Engineering geology investigation of talus slopes in Lewistown Narrows, Pennsylvania, *in* Faill, R. T., ed., Structure and Silurian-Devonian stratigraphy of the Valley and Ridge province, central Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 38th, Camp Hill, Pa., Guidebook, p. 39–44, illus., **1973.** Unconsolidated deposits of talus and colluvium cover most of the mountain slopes of central Pennsylvania. These deposits present problems in the design and construction of highways. The problems associated with the Lewistown Narrows (Mifflin County) are examined.
3. Review of a rock-slope design after construction, north-central Pennsylvania: Association of Engineering Geologists Bulletin, v. 10, no. 2, p. 157–160, illus., **1973.** The stability of a rock slope in the Catskill Formation is evaluated and compared to the predictions of stability in the original design.
4. (and Richards, J. W., and Camlin, B. M.). Designing a rock bolt system; using models and graphical and computer analyses: Engineering Geology and Soils Engineering Symposium, 15th, Proceedings, p. 121–132, illus., **1977** [not seen].
5. Engineering geology problems of the talus slopes in Lewistown Narrows [Mifflin County], *in* Branthoover, G. L., field trip chairman, Field trip guidebook—**1978** Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 200–204, illus., **1978.** The problems of locating highways in marginally stable geologic areas are described.

See also Camlin, B. M., 1; Inners, Jon D., 8; Schueck, Joseph H., 3.

BRENNER, FRED J.

1. (and Shertzer, Richard, Corbett, Scott, and Centofani, Jerry). Partial correlation analysis of some chemical and biological parameters of two streams receiving mine drainage: Pennsylvania Academy of Science Proceedings, v. 51, no. 2, p. 125–130, illus., **1977.** Iron, carbon dioxide, dissolved oxygen, pH, and community diversity were compared by partial correlation analysis for two streams

in the Neshannock Creek watershed, Mercer County. Several factors interact to affect overall stream productivity.

BRETSKY, PETER W.

1. Gradual species replacement in the Mahantango shales (Middle Devonian, central Pennsylvania) [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 371, **1978.**

BRIA, JAMES J., *see* Scharnberger, Charles K., 3.

BRICE, WILLIAM R.

1. (and Fry, Harold, Jr.). Field trip guidebook—Pennsylvania Earth Science Teacher's Society: Johnstown, Pa., University of Pittsburgh, 12 p., illus., **1973.** A general guide to the geology of the Johnstown area and Conemaugh Gap. Rocks seen on the trip belong to the Conemaugh and Allegheny Groups of Pennsylvanian age.
2. Charles Lyell and Pennsylvania: Pennsylvania Geology, v. 9, no. 2, p. 6–11, illus., **1978.** A biographical sketch of Lyell's life with emphasis given to the time spent in Pennsylvania.

BRIGGS, DEREK E. G.

1. A new trilobite-like arthropod from the Lower Cambrian Kinzers Formation, Pennsylvania: Journal of Paleontology, v. 52, no. 1, p. 132–140, illus., **1978.** A study of well-preserved material previously referred to as *Anomalocaris* led to the reassignment of *A. lineata* to a new genus, *Serracaris.*

BRIGGS, REGINALD P.

1. Guide to selected large-scale geologic maps of southwestern Pennsylvania [Allegheny, Armstrong, Beaver, Butler, Clarion, Fayette, Greene, Indiana, Lawrence, Somerset, Washington, and Westmoreland Counties]: U.S. Geological Survey Open-File Report, 26 p., map, **1973.** Available 1:62,500 and larger scale geologic maps of southwestern Pennsylvania are indexed and their utility as aids to land use and resource analysis is evaluated.
2. Map of overdip slopes that can affect landsliding in Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-543, scale 1:125,000, **1974.** Landslide susceptibility in relationship to overdip slopes is depicted.
3. Distribution of geologists in Pennsylvania: Pennsylvania Geology, v. 6, no. 3, p. 14–15, illus., **1975.** A short discussion of the general distribution of geologists in Pennsylvania in 1974. Urban areas had the higher concentrations.
4. (and Kohl, W. R.). Map of zones where land use can be affected by landsliding, flooding, and undermining, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-685-D, scale 1:50,000, 2 sheets, **1975.** Areas where landsliding, flooding, and undermining can occur are depicted.
5. (and Pomeroy, J. S., and Davies, W. E.). Landsliding in Allegheny County, Pennsylvania: U.S. Geological Survey Circular 728, 18 p., illus., **1975.** Because of the high occurrence of slope-stability problems in Allegheny County, future expansion must be cautiously undertaken.
6. (and Kohl, W. R.). Map showing major fold axes, satellite-imagery lineaments, elongate aeroradioactivity anomalies, and lines of structural discontinuity, southwestern Pennsylvania and vicinity: U.S. Geological Survey Miscellaneous Field Studies Map MF-815, scale 1:250,000, **1976.** This map was designed to com-

pare major naturally occurring rectilinear and elongate features that are expressed at the surface of the earth.

7. Earthquake risk, *in* Freedman, J. L., ed., "Lots" of danger—Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, p. 75–76, illus., 1977. Based on past history, the author concludes that severe earthquakes are not likely to occur in the greater Pittsburgh area, but that a moderate earthquake is possible.
8. Environmental geology, Allegheny County and vicinity, Pennsylvania— description of a program and its results: U.S. Geological Survey Circular 747, 25 p., illus., 1977. This discussion of landslides includes the causes of, evidence for, and brief descriptions of specific landslides.

See also Bushnell, Kent O., 6; Kohl, William R., 1, 3.

BRINDLEY, GEORGE W.

1. The fascination of clays and clay minerals: Earth and Mineral Sciences, v. 39, no. 8, p. 57–60, illus., 1970. Clay minerals and their importance to various industries are discussed.

BROADHEAD, R. F.

1. (and Kepferle, R. C., and Potter, P. E.). Gas-bearing Ohio Shale along Lake Erie—stratigraphy, petrology, and sedimentology [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 9, p. 1576, 1979; [abs.], *in* Barlow, H., ed., Proceedings; Third Eastern Gas Shales Symposium: [U.S. Department of Energy] Report METC/SP-79/6, p. 81–82, 1979.

BROCK, FRANK C., JR.

1. A study of minor folding in the Meadville area [Crawford County]: Meadville, Pa., Allegheny College, Bachelor's thesis, 1975.

BROOKMYER, BRYON

1. Pennsylvania's Cornwall-type iron mines: Rocks and Minerals, v. 53, no. 3, p. 135–139, illus., 1978. The Cornwall-type iron ore mines of Chester, Berks, Lancaster, Lebanon, and York Counties are reviewed. Lists of minerals that occur at each site are included.

BROWN, ALTON A.

1. Processes of micrite diagenesis determined by Mg distribution in micrite, cement, and fossils [abs.]: Geological Society of America Abstracts with Programs, v.11, no. 1, p. 5, 1979.

BROWN, CHARLES E.

1. Multivariate analysis of petrographic and chemical properties influencing porosity and permeability in selected carbonate aquifers in central Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, 1977; [abs.], Dissertation Abstracts International, v. 38, no. 5, p. 2083B–2084B, 1977.

BROWN, JONATHAN M., *see* Glassey, Richard D., 1.

BROWN, P. R.

1. (and Buchanan, H.). Tectonic diagenesis of Appalachian Middle Ordovician carbonate rocks—significance to resource exploration [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1891, 1974.

BROWN, ROBERT L.

1. Shallow ground-water flow systems beneath strip and deep mines at two sites, Clearfield County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1971.**
2. (and Parizek, R. R.). Shallow ground-water flow systems beneath strip and deep coal mines at two sites, Clearfield County, Pennsylvania: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report SR-84, 216 p., illus., **1971.** The groundwater flow systems in rock units associated with coals were studied in order to more effectively prevent, treat, isolate, or dilute acid mine drainage, as conditions require.

BROWN, S. A., *see* Miller, A. C., 1.

BROWN, WENDALL H.

1. Fold exposed in new cut: Pennsylvania Geology, v. 2, no. 2, p. 16, illus., **1971.** A very brief description of the fold axis of the Tremont syncline, newly exposed in a cut along Interstate Route 81 in Schuylkill County.

BROWN, WILLIAM R., *see* Blackburn, William H., 1; Davis, Philip A., Jr., 2.

BRUA, S. A.

1. Floods of July 19-20, 1977, in the Johnstown area, western Pennsylvania: U.S. Geological Survey Open-File Report 78-963, 82 p., illus., **1978** [not seen].

BRUSH, EDWARD J.

1. (and Kalinowski, Marie, and Miller, T. L.). Heavy metals in a stretch of the Susquehanna River badly polluted with acid mine effluents: Pennsylvania Academy of Science Proceedings, v. 53, no. 2, p. 179-188, illus., **1979.** The extent of pollution in the Susquehanna River near Wilkes-Barre was determined by sampling the water column, bottom sediments, and tissues of fish at three sites. The pollution of the river is due to a combination of acid mine drainage and organic wastes from urban areas in the Wyoming Valley.

BUCEK, MILENA F.

1. Surficial geology of the East Stroudsburg 7½ minute quadrangle, Monroe County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 214c, 40 p., illus. including geologic map, **1971.** The surficial deposits are described, their origin is interpreted, and their uses are discussed. Those interested in glacial geology and source material for construction will find this study useful.
2. Pleistocene geology and history of the West Branch of Susquehanna River valley near Williamsport, Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1975**; [abs.], Dissertation Abstracts International, v. 37, no. 2, p. 657B, **1976.**
3. (and Parizek, R. R.). Illinoian, Altonian, and Woodfordian glaciation of the West Branch Susquehanna River, Lycoming County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 33-34, **1975.**

See also Berg, Thomas M., 9.

BUCHANAN, H., *see* Brown, P. R., 1; Patchen, D. G., 1.

BUCHART-HORN

1. Licking Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 194, 107 p.,

33 p. appendix, illus. [no date]. This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

2. A study of mine drainage pollution abatement measures for the Loyalhanna watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 122, variously paginated, illus., **1972.** See annotation in entry 1 above.

BUCHAUER, MARILYN J.

1. Contamination of soil and vegetation near a zinc smelter by zinc, cadmium, copper, and lead: Environmental Science and Technology, v. 7, no. 2, p. 131–135, illus., **1973.** Within 1 km (0.6 mi) of the two zinc smelters at Palmerton (Carbon County), soil contains 135,000 ppm zinc, 1,750 ppm cadmium, 2,000 ppm copper, and 2,000 ppm lead. Contamination extends up to 39 km (24 mi) east and 16 km (10 mi) west.

BUCK, R. J.

1. (and Radner, L., Rifken, M., and Shaller, R. B.). Comprehensive analysis and action alternatives for northeastern Pennsylvania: U.S. Bureau of Mines Open-File Report 3–71, 3 v., variously paginated, illus., **1970.** The first phase of a comprehensive study of the anthracite region of Pennsylvania is summarized. The purpose is to develop a comprehensive view of the critical factors that influence economic growth in mining communities, with emphasis on the total quality of the community environment.

BUCKHAM, LESLIE, *see* Hanson, Henry, 1.

BUCKLEY, ROBERT

1. Effects of bedrock on soil mineralogy: Lewisburg, Pa., Bucknell University, Senior thesis, **1975.**

BUCKWALTER, THEODORE F.

1. (and Dodge, C. H., and Schiner, G. R.). Selected water resources data, Clarion River and Redbank Creek basins, northwestern Pennsylvania—Part 2: U.S. Geological Survey Water-Resources Investigations 79–19, 135 p., illus., **1979.** Selected basic data on aquifers, water levels, and yields of wells and springs are presented. Chemical analyses of water samples are given.

BUCKWALTER, TRACY V., *see* MacLachlan, David B., 2.

BULLER, ROBERT D.

1. Trichloroethylene contamination of groundwater: case history and mitigative technology [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 46, p. 827, **1979.**

BURKE, J. J.

1. Some ornamented erisocrinids from the Ames Limestone: Kirtlandia, no. 9, 17 p., illus., **1970.** Three new species of erisocrinid inadunate crinoids are described from the Ames Limestone, Conemaugh Group: *Delocrinus brookensis* and *Paradelocrinus decoratus* from Brooke County, West Virginia, and *Endelocrinus pennsylvanicus* from Allegheny County, Pennsylvania. *Endelocrinus pennsylvanicus* appears to be the largest Pennsylvanian representative of the genus and is characterized by spine-bearing primibrachs.

BUSANUS, JAMES W.

1. Faunal distribution within the Greenbrier-Mauch Chunk transition (Chesterian; Elviran) along the Chestnut Ridge anticline [Fayette County] [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 143–144, **1976.**

BUSCH, RICHARD M.

1. (and Fedosh, M. S.). *Welleraspis* (Trilobita) in the Conococheague Formation of southeast Pennsylvania: Pennsylvania Geology, v. 9, no. 6, p. 13–14, illus., **1978.** The discovery of the trilobite *Welleraspis swartzi* led the authors to assign some beds of the Conococheague Formation an early Late Cambrian age.

BUSCH, W. F.

1. (and Shaw, L. C.). Extent and frequency of floods on Schuylkill River near Norristown, Pennsylvania: U.S. Geological Survey Hydrologic Investigations Atlas HA-483, scale 1:16,000, **1973.**

See also Shaw, L. C., 1.

BUSHNELL, KENT O.

1. Ohiopyle State Park [Fayette County]—Geologic features of interest: Pennsylvania Geological Survey, 4th ser., Park Guide 7, pamphlet, illus. **[1971].** Information about the rock exposures, landscape, and geologic history of the park is provided.
2. Map showing areas that correlate with subsidence events due to underground mining of the Pittsburgh and Upper Freeport coal beds, Allegheny, Washington, and Westmoreland Counties, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-693-C, scale 1:125,000, **1975.** See annotation in entry 5 below.
3. Map showing depths to the Pittsburgh coal bed, mining activity, and related surface subsidence, Allegheny, Washington, and Westmoreland Counties, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-693-A, scale 1:125,000, **1975.** See annotation in entry 5 below.
4. McConnells Mill State Park [Lawrence County]—Slippery Rock Creek Gorge: Pennsylvania Geological Survey, 4th ser., Park Guide 9, pamphlet, illus. **[1975].** A popular account of the geologic history of this glaciated area.
5. (and Peak, J. R.). Map showing depths to the Upper Freeport coal bed, mining activity, and related surface subsidence, and the Redstone coal bed mines, Allegheny, Washington, and Westmoreland Counties, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-693-B, scale 1:125,000, **1975.** The purpose of the three maps listed is to identify areas where conditions may be encountered that can affect or inhibit the use of the land. In addition to being general indicators of the subsidence-related conditions, the first and third maps (entries 2 and 5) provide information useful in assessing possible directions of future coal development. The second map (entry 3) combines the information and provides a general classification of ground surface relative to mine-subsidence risk.
6. (and Briggs, R. P.). Map showing areas that correlate with subsidence events due to underground mining in Armstrong, Beaver, and Butler Counties, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-693-D, scale 1:125,000, **1976.** This map was part of a study to show that geologic and other mappable factors correlate with known damaging subsidence events and thereby either increase the predictability of subsidence events or, at least, enable a general classification of land relative to its potential for subsidence.

7. Mine subsidence, *in* Freedman, J. L., ed., "Lots" of danger— Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, p. 9–16, illus., **1977.** Geology and mining practices are reviewed in relation to surface subsidence. Laws affecting subsidence and steps a landowner can take to appraise his situation are outlined.

BUSS, D. R., *see* Parizek, Richard R., 15.

CAIN, BRUCE

1. Carboniferous paleomagnetics of the Appalachian basin: stratigraphy, depositional environments, and some paleomagnetic relationships of Pennsylvanian strata in western Pennsylvania: University of Pittsburgh, M.S. thesis, **1977.**
2. (and Donahue, J., Payne, M., Rollins, H. B., Schmidt, V. A., and Shulik, S.). Preliminary paleomagnetic results from Pennsylvanian Conemaugh Group sediments in southwestern Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 58, no. 6, p. 375–376, **1977**; [abs.], EOS (American Geophysical Union Transactions), v. 58, no. 8, p. 730, **1977.**

See also Payne, Michael A., 1.

CALAMARI, JOHN J.

1. (and Miller, T. J.). The geology of the Hellam Hills, York County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1971.**

CALDEMEYER, ROBERT D., *see* Wright, Thomas O., 2.

CALHOUN, EDWARD J., JR.

1. The petrology of the Baltimore gabbro complex along the Octoraro Creek, Pennsylvania-Maryland border: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1974.**

CALVERT, WARREN L.

1. Sub-Trenton structure of Ohio, with views on isopach maps and stratigraphic sections as basis for structural myths in Ohio, Illinois, New York, Pennsylvania, West Virginia, and Michigan: American Association of Petroleum Geologists Bulletin, v. 58, no. 6, p. 957–972, illus., **1974.** Certain paleoarches, described in geologic literature solely on the basis of thinning or absence of strata, are not confirmed by structural evidence. The author suggests that the "Adirondack arch" of New York, Pennsylvania, and West Virginia is not a structural entity.
2. Sub-Trenton structure of Ohio, with views on isopach maps and stratigraphic sections as basis for structural myths in Ohio, Illinois, New York, Pennsylvania, West Virginia, and Michigan: reply: American Association of Petroleum Geologists Bulletin, v. 59, no. 5, p. 879–880, **1975.**
3. Sub-Trenton structure of Ohio, with views on isopach maps and stratigraphic sections as basis for structural myths in Ohio, Illinois, New York, Pennsylvania, West Virginia, and Michigan: reply: American Association of Petroleum Geologists Bulletin, v. 59, no. 6, p. 1023, **1975.**

See also Weaver, Oscar D., 2, 3.

CAMERON, CORNELIA C.

1. Peat deposits of northeastern Pennsylvania: U.S. Geological Survey Bulletin 1317-A, 90 p., illus., **1970.** Peat resources in a 900-square-mile area in northeastern Pennsylvania are estimated at more than 13 million short tons of air-dried peat, chiefly of good-quality reed-sedge type.

2. Peat resources of the unglaciated uplands along the Allegheny structural front in West Virginia, Maryland, and Pennsylvania, *in* Geological Survey research 1970, Chapter D: U.S. Geological Survey Professional Paper 700-D, p. D153-D161, illus., **1970.** An estimated 634,000 short tons of commercial-quality air-dried peat was located along the Allegheny structural front. One deposit near State College, Centre County, contains about 100,000 tons of commercial-quality peat.
3. Relation of commercial quality of peat to bedrock and geologic structure: International Peat Congress, 3rd, Quebec, Canada, 1968, Proceedings, National Research Council of Canada, p. 98-101, illus., **1970** [not seen].

CAMLIN, B. M.

1. (and Branthoover, G. L., and Richards, J. W.). Cut slope stabilization using rock bolts: American Society of Civil Engineers Proceedings, Transportation Engineering Journal, v. 105, no. TE1, p. 31-39, illus., **1979** [not seen].

See also Branthoover, Gerald L., 4.

CAMPBELL, DAVID L.

1. Schlumberger electric soundings in and near Gettysburg basin, Pennsylvania: U.S. Geological Survey Open-File Report 76-773, 40 p., illus., **1976.** Nineteen electrical soundings showed a substantial electrical resistivity difference between Triassic sediments and an intrusive diabase.

CAMPBELL, LYLE D.

1. Occurrence of "*Ogygopsis* shale" fauna in southeastern Pennsylvania: Journal of Paleontology, v. 45, no. 3, p. 437-440, illus., **1971.** A poorly preserved fauna recently discovered in the upper member of the Kinzers Formation near Lancaster is essentially identical to the famous *Ogygopsis* shale fauna from Mt. Stephen, British Columbia. This is the first definite report of *Ogygopsis* outside of the Central Cordillera, and the first report of Middle Cambrian fossils from the Kinzers Formation since that of Walcott in 1896.

See also Kauffman, Marvin E., 1.

CANARY, P. E.

1. (and Keller, E. C., Jr.). Multivariate comparisons of water quality in selected streams and rivers in northern West Virginia and southwestern Pennsylvania [abs.]: West Virginia Academy of Science Proceedings, v. 50, no. 1, p. 17, **1978.**

CANICH, MICHAEL R., JR.

1. A study of fractures along the western segment of the Tyrone-Mount Union lineament: University Park, Pennsylvania State University, M.S. thesis, **1977.**
2. (and Gold, D. P.). A study of fractures in the Tyrone-Mount Union lineament [abs.], *in* Podwysocki, M. H., and Earle, J. L., eds., Proceedings of the Second International Conference on Basement Tectonics [Newark, Del., 1976]: Denver, Colo., Basement Tectonics Committee, p. 141, **1979.**

CARAMANICA, FRANK P.

1. Sedimentary control of Middle Devonian corals: Compass, v. 47, no. 3, p. 174-182, illus., **1970.** The Middle Devonian tabulate and rugose coral fauna in the Mahantango Formation of northeastern Pennsylvania exhibit patterns of development that coincide with a landward coarsening of clastic sedimentary rocks.

CAREY, J. B.

1. (and Cunningham, R. L., and Williams, E. G.). Loess identification in soils of southeastern Pennsylvania: Soil Science Society of America Journal, v. 40,

no. 5, p. 745–750, illus., **1976.** Testing of physical properties and analysis of the areal distribution of a silty mantle associated with the Duncannon, Lawrenceville, Chalfont, and Doylestown soil series indicate the material to be loess, probably derived from the Coastal Plain and Delaware River.

CAROTHERS, MARSHALL C.

1. Origin of Pine Creek mounds and their significance as near-shore indicaters [sic], *in* Donahue, J., and Rollins, H. B., Conemaugh (Glenshaw) marine events: American Association of Petroleum Geologists, Eastern Section, Annual Meeting, 3rd, and Society of Economic Paleontologists and Mineralogists, Eastern Section, Spring Field Trip, Pittsburgh, Pa., Guidebook, p. A1–A7, illus., **1974.** Six- to 10-foot-thick mounds in the Pine Creek limestone at two localities near New Kensington (Westmoreland County) are described and a sedimentary depositional model is presented.
2. (and Norton, C. W.). Biogenic mounds in the Lower Conemaugh (Missourian, Pennsylvanian) of the Appalachian basin [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 37–38, **1975.**
3. Depositional environments of the Cambridge Limestone (Missourian, Pennsylvanian) in the Appalachian basin: University of Pittsburgh, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 37, no. 8, p. 3821B–3822B, **1977.**
4. Depositional setting of the Cambridge Limestone (Conemaugh Group), an Upper Pennsylvanian (Missourian) marine transgression in the Appalachian basin [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 28, **1979.**
5. Depositional setting of the Cambridge Limestone (Conemaugh Group)—An Upper Pennsylvanian marine transgression in the Appalachian basin, *in* Donahue, Jack, and Rollins, H. B., eds., Geology of the northern Appalachian coal field: International Congress of Carboniferous Stratigraphy and Geology, 9th, Field Trip 2, Guidebook, University of Pittsburgh and Pittsburgh Geological Society, p. B1–B4, illus., **1979.** Utilizing petrographic and stratigraphic information and fossil evidence, a regional interpretation of Cambridge depositional environments was developed.
6. (and Sarg, J. F.). Burrow constructed bioherms in Cambridge (Pine Creek) Limestone (Conemaugh Group) of the Appalachian basin—a nearshore indicator [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 29, **1979.**

See also Donahue, Jack D., 3.

CARPER, EDWARD G., JR.

1. The New Enterprise quarry of Roaring Spring: Rocks and Minerals, v. 53, no. 3, p. 112–114, illus., **1978.** The geology and mineral deposits of this Blair County quarry are examined. Carbonates, including calcite, dolomite, strontianite, and smithsonite, are the most common minerals in the quarry.

CARR, MICHAEL D.

1. On the road (Geology of the I-83 highway from York, Pa. to Maryland line, Maryland): Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

CARSON ENGINEERS

1. Cowanshannock Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 159, 103 p., variously paginated appendices, illus., **1972.** This open-file report includes

an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

2. Stony Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 179, 411 p., illus., **1974.** See annotation in entry 1 above.

CARSWELL, LOUIS D.

1. (and Lloyd, O. B., Jr.). Geology and groundwater resources of Monroe County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 47, 61 p., illus. including geologic map, **1979.** A comprehensive description and inventory of the geology and groundwater resources. The availability and quality of the water resources are emphasized.
2. (and Lloyd, O. B., Jr.). Ground-water resources of Monroe County, Pennsylvania: U.S. Geological Survey Open-File Report 79-414, 102 p., illus., **1979** [not seen].

CARTER, BRIAN J.

1. Soil genesis and classification studies in Pennsylvania—Part I: Soil temperature regimes of the northern Appalachian Mountains; Part II: Genesis of soils developed in pre-Wisconsinan glacial till: University Park, Pennsylvania State University, M.S. thesis, **1979.**

CARUCCIO, FRANK T.

1. Trace element distribution in reactive and inert pyrite: Symposium on Coal Mine Drainage Research, 4th, Pittsburgh, Pa., 1972, Papers, p. 48-54, illus., **1972.** Preliminary research shows more titanium in stable pyrite and more silver in reactive pyrite, although the significance of this is not understood. Stable pyrite is from the upper Allegheny Group, which produces low-sulfate drainages, and reactive pyrite is from the lower Allegheny Group, which produces high-sulfate, highly acidic drainages.
2. Characterization of strip-mine drainage by pyrite grain size and chemical quality of existing groundwater, *in* Hutnik, R. J., and Davis, Grant, eds., Ecology and reclamation of devastated land: New York, Gordon and Breach, v. 1, p. 193-226, illus., **1973.** The quality of groundwater in bituminous coal fields can be predicted from the distribution and grain size of pyrite in the strata and the initial composition of the groundwater.
3. Predicting the chemical quality of acid mine drainage [abs.]: EOS (American Geophysical Union Transactions), v. 55, no. 4, p. 251, **1974.**
4. (and Ferm, J. C.). Paleoenvironment; predictor of acid mine drainage problems: Symposium on Coal Mine Drainage Research, 5th, Papers, p. 5-10, illus., **1974** [not seen].
5. Estimating the acid potential of coal mine refuse, *in* Chadwick, M. J., and others, eds., The ecology of resource degradation and renewal: Symposium of the British Ecological Society, 15th, 1973, New York, John Wiley and Sons, p. 197-205, illus., **1975** [not seen].

See also Horne, John C., 1.

CASE, ROBERT

1. The structure and stratigraphy of the Marion Center quadrangle, Indiana County, Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1975.**

CASWELL, ANDREW W.

1. A comparative analysis and evaluation of the Martins Creek and Little Bushkill Creek drainage basins: Easton, Pa., Lafayette College, Senior thesis, **1970.**

CATE, ADDISON S.

1. (and Heyman, Louis). Regional geologic setting of western Pennsylvania, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 3–7, illus., **1970.** Western Pennsylvania is located in the Appalachian Plateaus province. Surface features of the area are discussed.

See also Wagner, Walter R., 6.

CAVALLARO, J. A.

1. (and Johnston, M. T., and Deurbrouck, A. W.). Sulfur reduction potential of the coals of the United States—A revision of Report of Investigations 7633: U.S. Bureau of Mines Report of Investigations 8118, 323 p., illus., **1976.** A washability study of 103 raw coal channel samples of Pennsylvania bituminous coal indicates that generally significant sulfur reduction is achieved by finer crushing and removal of higher specific-gravity increments.

CAVANAUGH, T.

1. A limited hydrological and geological study of the lower Bushkill Creek: Easton, Pa., Lafayette College, Senior thesis, **1972.**

CAVAROC, VICTOR V., JR.

1. Geology of some Carboniferous lower deltaic plain sediments of western Pennsylvania: Louisiana State University, Ph.D. thesis, **1969;** [abs.], Dissertation Abstracts International, v. 30, no. 11, p. 5098B, **1970.**
2. (and Saxena, R. S.). Crevasse splay deposits in the state line area of northwestern Pennsylvania and northeastern Ohio, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 160–172, illus., **1979.** Sedimentological characteristics of the rock units above the Middle Kittanning coal bed are discussed and related to environment of deposition.

See also Ferm, John C., 9.

CECIL, C. BLAINE

1. (and Stanton, R. W., Dulong, F. T., and Renton, J. J.). Geologic factors that control mineral matter in coal, *in* Donaldson, A. C., and others, eds., Carboniferous coal short course and guidebook: Volume 3: West Virginia Geological and Economic Survey Bulletin B-37-3, Supplement, p. 43–56, illus., **1979.** Variations in ash and sulfur content of coals are explained in terms of the chemistry of the peat environment, bacterial activity, the mineral content of the vegetal matter that becomes peat, and the detrital minerals that are introduced into the swamp.

See also Finkelman, Robert B., 5, 7; Minkin, Jean A., 1.

CENTOFANI, JERRY, *see* Brenner, Fred J., 1.

CERVIK, JOSEPH, *see* Fields, H. H., 1.

CHADDERTON, R. A., *see* Miller, A. C., 1.

CHAMBERLAIN, JOHN A., JR., *see* Wallace, Robert J., 1.

CHAMBERLAIN, STEVEN C.

1. (and Dossert, W. P.). Faylor-Middlecreek quarry, Winfield, Pennsylvania: Rocks and Minerals, v. 54, no. 3, p. 104–107, illus., **1979.** Located in Union County,

this quarry has significant quantities of calcite, strontianite, celestine, pyrite, galena, and sphalerite.

CHANCE, H. M. (1856–1937)

1. Report on the mining methods and appliances used in the anthracite coal fields: Pennsylvania Geological Survey, 2nd ser., Report AC, 574 p., illus., **1883.** Contemporary account of mining methods and equipment in use in the 1880's. Includes a brief history of anthracite mining and descriptions of mining conditions.

CHAO, EDWARD C. T., *see* Minkin, Jean A., 1.

CHAPMAN, WILLIAM F.

1. A user's guide to the glacial map of the Oil City 7½ ′ quadrangle, Venango County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report, 46 p., illus., **1976.** The importance of a glacial map for land use planning is emphasized.
2. (and Craft, J. L.). Glacial aspects of the Oil City area, *in* Ward, A. N., Jr., and others, Bedrock and glacial geology of northwestern Pennsylvania in Crawford, Forest and Venango Counties: Annual Field Conference of Pennsylvania Geologists, 41st, Titusville, Pa., Guidebook, p. 1–6, illus., **1976.** The Mapledale and Titusville Tills are examined, along with glaciofluvial deposits. Carbon-14 dating of peat gives an age of 40,000 years B.P. for the Titusville Till.
3. (and Ward, A. N., Jr.). A user's guide to the potential mineral resources map of the Oil City 7½ ′ quadrangle, Venango County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report, 33 p., illus., **1976.** The most abundant potential resources are aggregate resources: sand, gravel, and crushed stone.

See also Craft, Jesse L., 6; Ward, Albert N., Jr., 2, 3.

CHAPPLE, WILLIAM M., *see* Wiltschko, David V., 1, 2.

CHASE, CAROL M.

1. Central Pennsylvania sand dunes: Pennsylvania Geology, v. 8, no. 3, p. 9–12, illus., **1977.** Along the West Branch of the Susquehanna River near Lewisburg are sand dunes formed during Wisconsinan time. The climatic conditions of their development are discussed.

CHEDESTER, D.

1. Resistance as a function of relative bed smoothness in Woodcock Creek, Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1974.**

CHEMERYS, J. C., *see* Hobba, W. A., Jr., 1.

CHEN, CHENG-LUNG

1. (and Armbruster, J. T.). Field verification of reconstructed dam-break flood, Laurel Run, Pennsylvania: U.S. Geological Survey Open-File Report 79–1483, 47 p., **1979** [not seen].

CHEN, PING-FAN

1. Lower Paleozoic stratigraphy, tectonics, paleogeography, and oil/gas possibilities in the central Appalachians (West Virginia and adjacent states)—Part 1. Stratigraphic maps: West Virginia Geological and Economic Survey Report of Investigations RI-26-1, 141 p., illus., **1977.** A comprehensive and detailed analysis of the major geologic features of the central Appalachian basin in Early Paleozoic time. Information is provided on the lithologic and thickness changes of the Lower Paleozoic rocks by formation, group, and system.

THE CHESTER ENGINEERS

1. Slippery Rock Creek mine drainage treatment plant: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 104, 31 p., 8 p. appendix, illus., **1973.** This open-file report concerns the design and implementation of a mine drainage treatment plant near the headwaters of the North Branch of Slippery Rock Creek.

CHEWNING, JOHN R.

1. (and Merkel, R. H.). The use of resistivity to define aquifers polluted from acid mine drainage [central Pennsylvania] [abs.]: EOS (American Geophysical Union Transactions), v. 53, no. 4, p. 368, **1972.**

CHOI, D. S., *see* Dahl, H. D., 2; Stefanko, Robert, 1.

CHOU, I-MING, *see* Eugster, Hans P., 1.

CHOW, TSAIHWA J.

1. (and Earl, J. L.). Lead and uranium in Pennsylvania anthracite: Chemical Geology, v. 6, no. 1, p. 43–49, illus., **1970.** From isotopic analysis, it was determined that lead was incorporated into the ancient bedded plant material in Carboniferous time prior to coalification, whereas the uranium was introduced after coalification.

CHRISTIAN, R. P., *see* Keidel, F. A., 1.

CHURCHILL, NORMAN J.

1. Soil survey of Venango County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 86 p., illus., **1975.** A detailed account of soil types, along with maps, provides a complete review of the soils.

CICIARELLI, JOHN A.

1. Geomorphic evolution of anticlinal valleys in central Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1971;** [abs.], Dissertation Abstracts International, v. 32, no. 9, p. 5251B, **1972.**

CIOLKOSZ, EDWARD J.

1. (and Kardos, L. T., and Beers, W. F.). The effect of acid mine drainage water on two Pennsylvania soils: Soil Science, v. 127, no. 2, p. 102–107, **1979.** Rayne and Guernsey soil material that had 525 cm (207 in.) of acid mine water passed through it was analyzed. The pH, calcium content, and percent base saturation of the soil material were lowered, and its CeC, acidity, and iron and aluminum content increased.
2. (and Petersen, G. W., and Cunningham, R. L.). Landslide-prone soils of southwestern Pennsylvania: Soil Science, v. 128, no. 6, p. 348–352, illus., **1979.** The instability of the landslide-prone soils is a function of high clay content; a high proportion of the clay is of an expandable type.
3. (and Petersen, G. W., Cunningham, R. L., and Matelski, R. P.). Soils developed from colluvium in the Ridge and Valley area of Pennsylvania: Soil Science, v. 128, no. 3, p. 153–162, illus., **1979.** The topography of the unglaciated Valley and Ridge area is the result of complex geologic uplift and erosion. The product is a series of major ridges composed primarily of hard sandstone, quartzite, or conglomerate inherited from the parent material. The soils are relatively stable and probably date to the Wisconsinan glaciation.

See also Bilzi, A. F., 1; Cunningham, Robert L., 1; Ranney, Richard W., 1, 2.

CIPRA, J. E., *see* Mathews, H. L., 1.

CISNE, JOHN L.

1. *Constantina pulchra:* an unusual proetid trilobite from the Devonian of Pennsylvania: Journal of Paleontology, v. 44, no. 3, p. 522–523, illus., **1970.** The specimen is from Conewango Stage beds near Warren (Warren County). This Late Devonian example is markedly similar to odontopleurid trilobites.

CLANCY, JAMES

1. (and Cody, Michael). Geology of the Springettsbury-Hellam area, York County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1971.**

CLARK, JOHN H.

1. Geology of the carbonate rocks in western Franklin County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Progress Report 180, scale 1:24,000, 1 sheet, **1970.** Bedrock exposed near Mercersburg ranges from Middle Cambrian to Late Ordovician in age. The map shows six to eight major anticlines and synclines; the dominant features are the northeast-trending faults.

CLARK, W. J., *see* Ferm, John C., 7.

CLAYPOOL, G. E.

1. (and Threlkeld, C. N., and Bostick, N. H.). Natural gas occurrence related to regional thermal rank of organic matter (maturity) in Devonian rocks of the Appalachian basin, *in* Preprints—Second Eastern Gas Shales Symposium [Morgantown, W. Va., 1978]: U.S. Department of Energy Report METC/SP-78/6, v. 1, p. 54–65, illus., **1978.** A methodology is proposed to estimate the volume of gas generated in the Devonian black shales. Factors in this estimate are the volume of Devonian black shale and the various degrees of conversion of organic matter to gas based on patterns of gas composition.
2. (and Stone, A. W.). Organic carbon content of Devonian shale sequence in drill cuttings from eighteen wells in western Pennsylvania: U.S. Geological Survey Open-File Report 79–1665, 12 p., **1979** [not seen].

See also Baker, Donald R., 1.

CLEMENS, ROBERT H.

1. An investigation of sediment transport on Arrowhead Beach, Lake Erie: Meadville, Pa., Allegheny College, Bachelor's thesis, **1973.**

CLENDENIN, JOHN

1. Fracture traces in the Meadville area [Crawford County]: Meadville, Pa., Allegheny College, Bachelor's thesis, **1972.**

CLENDENING, JOHN A.

1. *Laevigatosporites dunkardensis,* new name for *Laevigatosporites plicatus* Clendening, 1969: Journal of Paleontology, v. 44, no. 4, p. 788, **1970.** A nomenclature note.
2. Sporological evidence on the geological age of the Dunkard strata in the Appalachian basin: Morgantown, West Virginia University, Ph.D. thesis, **1970;** [abs.], Dissertation Abstracts International, v. 31, no. 5, p. 2762B, **1970.**
3. Palynological evidence for a Pennsylvanian age assignment of the Dunkard Group in the Appalachian basin [abs.], *in* Barlow, J. A., ed., I. C. White Memorial Symposium [Morgantown, W. Va., 1972]—the age of the Dunkard: Symposium Abstracts and Reference Papers, West Virginia Geological and Economic Survey, p. 27–28, **1972.**

4. Palynological evidence on the geological age of the Dunkard Group of West Virginia, Pennsylvania, and Ohio [abs.]: American Association of Stratigraphic Palynologists, Annual Meeting, 3rd, Proceedings, 1970, Geoscience and Man, v. 4, p. 129, **1972.**
5. Stratigraphic placement of the Dunkard according to palynological assemblages: Castanea, v. 37, no. 4, p. 258–287, illus., **1972.** Small spore taxa from the Dunkard strata are listed in stratigraphic sequence. It is concluded that the occurrence of *Triquitrites,* the cumulation of monolete spore genera, the limited appearance of bisaccate, striate pollen, and the continuing occurrence of Pennsylvanian trilete spores are positive evidence for assigning a Pennsylvanian age to the Dunkard.
6. (and Gillespie, W. H.). Stratigraphic placement of the Dunkard—A review of the paleobotanical and other evidence: Castanea, v. 37, no. 1, p. 26–48, illus., **1972.** The age designation of the Dunkard series, long a controversial subject, is reviewed through the literature, and evidence is presented to place it in the Pennsylvanian.
7. Palynological evidence for a Pennsylvanian age assignment of the Dunkard Group in the Appalachian basin, Part II: West Virginia Geological and Economic Survey Coal-Geology Bulletin 3, 107 p., illus., **1974.** Systemic assignment of the Dunkard Group and the use of palynological evidence for age determination are emphasized.
8. Palynological evidence for a Pennsylvanian age assignment of the Dunkard Group in the Appalachian basin: Part I, *in* Barlow, J. A., and Burkhammer, Susan, eds., Proceedings of the First I. C. White Memorial Symposium [Morgantown, W. Va., 1972]—"The age of the Dunkard": West Virginia Geological and Economic Survey, p. 195–216, illus., **1975.** A palynological study of 115 samples of shales and coals from the Dunkard Group supports the assignment of the entire group to the Pennsylvanian System.

CLOOS, ERNST

1. The southeastern border of the Triassic graben in Pennsylvania; fault or overlap? [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 526, **1971.**
2. (and Pettijohn, F. J.). Southern border of the Triassic basin, west of York [York County], Pennsylvania: fault or overlap?: Geological Society of America Bulletin, v. 84, no. 2, p. 523–536, illus., **1973.** The southern border of the Triassic basin is probably not a simple overlap as previously thought. More investigation is necessary to determine if the border is an overlap or a fault.
3. Mining Cambrian limestone at Thomasville [York County], Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 12–13, **1974.**

COAL AGE

1. Chestnut Ridge, energy for millions; economic impact: Coal Age, v. 75, no. 10, p. 99, **1970.** A very brief discussion of the economic impact of mining on a local area in western Pennsylvania.
2. Pressure flushing speeds backfilling of abandoned underground mines: Coal Age, v. 80, no. 1, p. 68–70, illus., **1975.** This method of backfilling proved successful in several Pennsylvania mines.

COATES, DONALD R.

1. Mastodon bone in Bradford Co.: Pennsylvania Geology, v. 1, no. 6, p. 4–5, illus., **1970.** A pelvic fragment was discovered in a gravel pit in the Chemung River valley. A location map is included.

2. (and Landry, S. O., and Lipe, W. D.). Mastodon bone age and geomorphic relations in the Susquehanna Valley: Geological Society of America Bulletin, v. 82, no. 7, p. 2005–2009, illus., **1971.** A mastodon bone found near the southern New York border in Bradford County yields a radiocarbon date of 13,320 ± 200 years B.P. Geomorphic mapping and other radiometric dates suggest the postglacial development of floodplains and alluvial fans along major rivers in southern New York, rather than during glacial substages.
3. (and King, C. A. M.). Field guide—Great Bend trip, *in* Coates, D. R., ed., Glacial geology of the Binghamton-western Catskill region: Binghamton, N. Y., State University of New York Publications in Geomorphology, Contribution 3, p. 69–75, **1973.** Includes descriptions of morphology and materials at three localities in Pennsylvania.
4. (and King, C. A. M.). Glacial geology of Great Bend and adjacent region, *in* Coates, D. R., ed., Glacial geology of the Binghamton-western Catskill region: Binghamton, N. Y., State University of New York Publications in Geomorphology, Contribution 3, p. 2–30, illus., **1973.** A very detailed account of glaciation and drainage development in the area east and southeast of Binghamton, New York. Includes a general discussion of till-shadow hills and some specifics on glacial meltwater channels in Pennsylvania.
5. Reappraisal of the glaciated Appalachian Plateau, *in* Coates, D. R., ed., Glacial geomorphology: Binghamton, N. Y., State University of New York Publications in Geomorphology, p. 205–243, illus., **1974.** The hydrologic, structural, erosional, and depositional features of the Appalachian Plateau of northern Pennsylvania and southern New York are reviewed.
6. (and Kirkland, J. T.). Application of glacial models for large-scale terrain derangements, *in* Mahaney, W. C., ed., Quaternary environments—Proceedings of a symposium: Toronto, Canada, York University, Atkinson College, no. 5, p. 99–136, illus., **1974** [not seen].
7. Hydrogeomorphology of Susquehanna and Delaware basins: Geomorphology Symposia Series 2, p. 272–306, illus., **1975** [not seen].
8. Quaternary stratigraphy of New York and Pennsylvania: [abs.], *in* Mahaney, W. C., chairperson, Quaternary Stratigraphy Symposium: York University, Toronto, Canada, 1975, Abstracts with Program, p. 27–30, **1975**; *in* Mahaney, W. C., ed., Quaternary stratigraphy of North America: Stroudsburg, Pa., Dowden, Hutchinson and Ross, p. 65–90, illus., **1976.** Three major ice lobes glaciated the New York-Pennsylvania region: the Erie lobe, the Ontario lobe, and the Hudson-Champlain lobe. Early stratigraphic studies are reviewed and new research introduced.

See also King, Cuchlaine A. M., 1, 2.

COBUCCI, DOLORES A.

1. The geology of Chestnut Ridge anticline in the vicinity of Laurel Caverns, Fayette County, Pennsylvania, *in* Rollins, H. B., field trip coordinator, National Association of Geology Teachers, Eastern Section—Annual Spring field trips: National Association of Geology Teachers, Eastern Section, Pittsburgh, Pa., University of Pittsburgh, Guidebook, p. 1–20, illus., **1973.** The Chestnut Ridge anticline is discussed in relation to the Pittsburgh-Huntingdon basin and other geologic features. The excursion extended from the axis of the Pittsburgh-Huntingdon basin to the Chestnut Ridge anticline.
2. Guide to the geology of selected field sites in southwestern Pennsylvania: University of Pittsburgh, Ph.D. thesis, **1974**; [abs.], Dissertation Abstracts International, v. 35, no. 4, p. 1737B–1738B, **1974.**

COCHRAN, WILLIAM

1. Grace mine iron ore waste disposal system and estimated costs: U.S. Bureau of Mines Information Circular 8435, 17 p., illus., **1969.** The system was designed to minimize environmental effects while allowing part of the waste to be utilized as aggregate.

COCKER, MARK

1. Metamorphism of Triassic sedimentary rocks at New Hope, Pennsylvania: Easton, Pa., Lafayette College, Senior thesis, **1971.**

CODY, MICHAEL, *see* Clancy, James, 1.

COFFMAN, WILLIAM P., *see* Wartinbee, David C., 1.

COHEE, GEORGE V., *see* de Witt, Wallace, Jr., 8.

COHEN, J. P.

1. Pegmatite mineralogy in the Wissahickon schist near Philadelphia, Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Honor's paper, **1973.**

COHN, BARRY P., *see* Leonard, Jay E., 1.

COLBERT, EDWIN H., *see* Gillette, David D., 2.

COLE, GARY A.

1. (and Williams, D. A., and Smith, C. J.). Regional coalification patterns in eastern Kentucky, Virginia, West Virginia, Ohio, Maryland, and southern Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 9, p. 1577, **1979.**

COLEMAN, S. LYNN

1. (and Medlin, J. H., Meissner, C. R., Trent, V. A., Windolph, J. F., Jr., and Englund, K. J.). Environmental consideration of the distribution of trace elements in selected low-sulfur bituminous coal and anthracite beds of the Appalachian basin [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 7, p. 1032–1033, **1975.**

See also Medlin, Jack H., 1.

COLL, M. B., JR.

1. (and Beall, R. M.). Map showing selected extreme-streamflow statistics and drainage areas, Greater Pittsburgh Region, Pennsylvania: U.S. Geological Survey Open-File Report 76–350, scale 1:125,000, **1976** [not seen].

COLLIER, JEFFREY A.

1. The geology of the Kutztown Area School District [Berks County]: University Park, Pennsylvania State University, M.Ed. thesis, **1978.**

COLLINS, A.

1. The Allentown Dolomite; stratigraphy, petrology, and paleontology [Lehigh County]: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1978.**

COLMAN, CHRISTOPHER S.

1. A discussion of Gap nickel mine and the results of a geophysical survey of the area [Lancaster County]: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1978.**

See also Stephens, George C., 2.

COLTON, GEORGE W.

1. The Appalachian basin—its depositional sequences and their geologic relationships, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 5–47, illus., **1970.** A stratigraphic and geographic framework for the predominantly miogeosynclinal suite of rocks in the Appalachian basin is presented.

See also Harris, Leonard D., 2.

CONABLE·SAMPSON·VAN KUREN·HUFFCUT·GERTIS

1. Dents Run mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 161, variously paginated, illus. **[1971].** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

CONKWRIGHT, ROBERT D., *see* Hastings, David S., 1.

CONNALLY, G. GORDON

1. (and Epstein, J. B.). Regional deglacial sequences in northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 150, **1973.**
2. (and Sirkin, L. A., and Sevon, W. D.). Woodfordian history of the Delaware-Minisink lobe [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 7–8, **1979.**

CONRAD, BARBARA

1. (and Geyer, Alan). Can earthquakes happen here: Pennsylvania Geology, v. 2, no. 2, p. 2–3, illus., **1971.** Earthquakes in the eastern United States are believed to be caused mainly by minor crustal adjustments related to the retreat of the great ice sheet about 15,000 years ago, and by minor stresses between continental and oceanic crustal plates. Pennsylvania does not have serious earthquake problems.
2. Stalking the trilobite on Sherman Ridge: Pennsylvania Geology, v. 7, no. 5, p. 7–8, illus., **1976.** The upper shale and siltstone units of the Sherman Ridge Member of the Mahantango Formation in Perry County yielded a new fossil-collecting locality for the seldom-found trilobite.

CONTE, DONALD J.

1. Strip mining in Luzerne Township, Fayette County, Pennsylvania: California, Pa., California State College, M.S. thesis, **1979.**

COOK, J. R.

1. Comparative surface water chemistry of three lakes in Susquehanna County, Pennsylvania: Binghamton, State University of New York, M.S. thesis, **1977.**

COOK, N. E., JR.

1. (and Ko, H.-Y., and Gerstle, K. H.). Variability and anisotropy of mechanical properties of the Pittsburgh coal seam: Rock Mechanics (Vienna), v. 11, no. 1, p. 3–18, illus., **1978.** The results are presented of testing to determine vertical variation of material stiffness and strength of the Pittsburgh coal seam in the U.S. Bureau of Mines experimental mine at Bruceton, Allegheny County. The coal seam was divided into four zones of approximately equal thickness. Two of these zones had measurably different properties, but the differences were small.

COON, JULIAN B.

1. (and Dobecki, Thomas). Field evaluation of high resolution seismic reflection techniques for coal exploration in southwestern Pennsylvania, *in* Voelker, R. M., ed., Proceedings: Coal Seam Discontinuities Symposium: Pittsburgh, Pa., 1976, D'Appolonia, 18 p., illus., **1978.** A general discussion of approaches, problems, and results of using seismic techniques to locate sand channels in the Pittsburgh coal seam.

COOPER, FRANKLIN D.

1. The mineral industry of Pennsylvania in 1970: Pennsylvania Geological Survey, 4th ser., Information Circular 73, 35 p., illus., **1972**; reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1970, v. 2, p. 597–631, illus., **1972.**
2. The mineral industry of Pennsylvania in 1971: Pennsylvania Geological Survey, 4th ser., Information Circular 74, 44 p., illus., **1974**; reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1971, v. 2, p. 595–638, illus., **1973.**
3. The mineral industry of Pennsylvania in 1972: Pennsylvania Geological Survey, 4th ser., Information Circular 78, 52 p., illus., **1975**; reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1972, v. 2, p. 577–628, illus., **1974.**
4. The mineral industry of Pennsylvania in 1973: Pennsylvania Geological Survey, 4th ser., Information Circular 81, 49 p., illus., **1976**; reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1973, v. 2, p. 569–617, illus., **1976.**

COOPER, M. C., *see* Klemic, Harry, 1.

COPELAND, MURRAY J.

1. (and Berdan, J. M.). Late Silurian and Early Devonian ostracode provinces in eastern North America [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 154, **1976.**

CORBETT, SCOTT, *see* Brenner, Fred J., 1.

CORNELL, JAMES R.

1. Future petroleum potential of eastern Pennsylvania, *in* Cram, I. H., ed., Future petroleum provinces of the United States—their geology and potential: American Association of Petroleum Geologists Memoir 15, v. 2, p. 1243–1247, illus., **1971.** Nearness to metropolitan areas and the need for locating suitable structures for underground storage of natural gas offer some inducement for future petroleum exploration in eastern Pennsylvania.

CORNET, BRUCE

1. Preliminary investigation of two Late Triassic conifers from York County, Pennsylvania, *in* Romans, R. C., ed., Geobotany: New York, Plenum Press, p.165–172, illus., **1977.** The conifers, briefly described and illustrated, are from a rich plant-bearing layer of Late Carnian age in the New Oxford Formation in the Gettysburg basin.
2. The palynostratigraphy and age of the Newark Supergroup: University Park, Pennsylvania State University, Ph.D. thesis, **1977**; [abs.], Dissertation Abstracts International, v. 38, no. 12, pt. 1, p. 5815B, **1978.**

CORTIS, S. E.

1. (and Alexander, T. B., Edmunds, W. E., and Craft, J. L.). Greater Pittsburgh Region maps of mined-out areas and thickness of rock over the Pittsburgh coal: Pennsylvania Geological Survey, 4th ser., Map 45, scale 1:125,000, 2 sheets, **1975.** In addition to the maps there are brief descriptions of lithologies, a stratigraphic section, and a brief historical statement.

COSTA, JOHN E.

1. Response of a Piedmont watershed to Hurricane Agnes, June 1972 [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 151, **1973.**

COTTER, EDWARD

1. The evolution of fluvial style, with special reference to the central Appalachian Paleozoic, *in* Miall, A. D., ed., Fluvial sedimentology: Canadian Society of Petroleum Geologists Memoir 5, p. 361–383, illus., **1978.** The change in fluvial style of the Paleozoic sequence is credited to the advent of land vegetation, which altered flood peaks and sediment yields, enhanced production of finer sediment, and stabilized stream banks.
2. Depositional complexity of the Tuscarora Sandstone (Lower Silurian) in central Pennsylvania—a preliminary report [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 8, **1979.**
3. (and Hallam, S. L.). Storm-interstorm alternation on a compositionally evolving shallow marine shelf: the Middle Silurian (Rose Hill and Mifflintown) of central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 8, **1979.**

COUSIN, S. B., *see* Stingelin, Ronald W., 2.

COX, J. C.

1. (and Harrison, S. S.). Fracture-trace influenced stream orientation in glacial drift, northwestern Pennsylvania: Canadian Journal of Earth Sciences, v. 16, no. 7, p. 1511–1514, illus., **1979.** Measurement of over 2,500 stream segments revealed that 43 percent were oriented 30 to 60 degrees east of west of north. This preferred orientation is statistically highly significant (0.001 level). Contrary to expectations, the degree to which stream orientation is influenced by fracture traces does not appear to decrease with increasing drift thickness.

COX, KENNETH R.

1. Hydrogeological problems and their resolutions at the Friedensville mine, *in* Argall, G. O., Jr., and others, eds., Proceedings of the First International Mine Drainage Symposium: San Francisco, Miller Freeman Publications, p. 617–626, illus., **1979** [not seen].

COZART, CHERYL L., *see* Heyman, Louis, 13, 14; Piotrowski, Robert G., 13, 14.

CRAFT, JESSE L.

1. Geologic and man-generated factors of urban landslides, Pittsburgh region, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 7, p. 699, **1974.**
2. Is a geologic evaluation of a development site needed?: Pennsylvania Geology, v. 5, no. 3, p. 2–5, illus., **1974.** A pictorial review of geologic hazards in southwestern Pennsylvania.

3. The role of structure in an urban landslide [abs.]: Pennsylvania Academy of Science Proceedings, v. 48, p. 155, **1974.**
4. The role of geological reviews in the A-95 process [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 42, **1975.**
5. A user's guide to the oil and gas well distribution map of the Oil City 7½ ' quadrangle, Venango County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report, 33 p., illus., **1976.** The methods used in developing the oil and gas well distribution map and the ways in which the map can be used are discussed.
6. (and Chapman, W. F., Lukert, M. T., and Ward, A. N., Jr.). Environmental geology applied to rural-urban needs [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 155-156, **1976.**
7. (and Heyman, Louis, and Piotrowski, R. G.). Greater Pittsburgh Region thickness of rock over the Upper Freeport coal: Pennsylvania Geological Survey, 4th ser., Map 49, scale 1:125,000, **1976.** Thickness contours were drawn at 0, 100, 200, and 300 feet, 0 feet being the crop line of the Upper Freeport coal. Environmental implications of each 100-foot thickness category are reviewed.
8. Quality of gravel resources in northwestern Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 86, 54 p., illus., **1979.** Natural aggregates are reviewed, and sand and gravel pits that are being worked are listed by county.

See also Chapman, William F., 2; Cortis, S. E., 1; Heyman, Louis, 12; Wagner, Walter R., 9, 10; Ward, Albert N., Jr., 2.

CRAIG, JAMES R., *see* Speer, J. Alexander, 5.

CRAIG, RICHARD G.

1. Comparison of patterns from Earth Resources Technology Satellite multispectral scanner and glacial drift, northwestern Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1976.**
2. A simulation model of landform erosion: University Park, Pennsylvania State University, Ph.D. thesis, **1979.**

CRAMER, HOWARD ROSS

1. Annotated bibliography of Pennsylvania geology—supplement to 1969: Pennsylvania Geological Survey, 4th ser., General Geology Report 61, 345 p., **1972.** The third bibliography in this series; the others are General Geology Reports 34 and 42.

CRANDON, DAVID

1. Multiple deformation of the Cumberland Valley sequence at the Hempt Bros. quarry, Camp Hill, Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

CRAWFORD, MARIA L.

1. Introduction to the geology of the crystalline rocks of southeastern Pennsylvania, *in* Amenta, R. V., and others, Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, p. 1-9, illus., **1974.** The rocks that lie south of the Triassic basin are divided into three groups: (1) Paleozoic and younger rocks of known ages; (2) intermediate to high-grade metamorphic rocks of unknown age but possibly late Precambrian to Ordovician; and (3) Grenville basement, consisting of meta-igneous and metasedimentary rocks, generally considered Precambrian in age.

2. The Pennsylvania Piedmont; remnant of a back-arc basin?, *in* Halsey, S. D., and others, eds., Women in geology: Northeastern Women's Geoscientists Conference, 1st, St. Lawrence University, Canton, N. Y., 1976, Proceedings, Canton, N. Y., Ash Lad Press, p. 35–43, illus., **1976** [not seen].
3. Calcium zoning in almandine garnet, Wissahickon Formation, Philadelphia, Pennsylvania: Canadian Mineralogist, v. 15, pt. 2, p. 243–249, illus., **1977.** Garnets in rocks of various compositions from the staurolite zone of amphibolite facies of a prograde metamorphic terrain are discussed.
4. (and Mark, Lawrence). Early Paleozoic metamorphic history, S.E. Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 58, no. 6, p. 517, **1977.**
5. Metamorphic history of the Pennsylvania Piedmont [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 383, **1978.**

See also Amenta, Roddy V., 4; Grauert, Borwin W., 1, 3; Wagner, Mary Emma M., 2, 4.

CRAWFORD, WILLIAM A.

1. (and Robelen, P. G., and Kalmbach, J. H.). The Honey Brook anorthosite: American Journal of Science, v. 271, no. 11, p. 333–349, illus., **1971.** The mineralogical and chemical characteristics, as well as the alternate models of crystallization, were studied to determine the origin of the crude zoning and banding in the Honey Brook anorthosite body.
2. (and Huntsman, J. R.). Metamorphic rock types, Wagontown 7½ ′ quadrangle, Chester County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 156, **1976.**
3. Geologic remapping and meatamorphic [sic] history of the Honey Brook Upland, S.E. Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 8–9, **1979.**

See also Amenta, Roddy V., 4; Roberts, Francis H., 2.

CROCK, J. G.

1. Determination of trace amounts of lead in geological materials: University Park, Pennsylvania State University, M.S. thesis, **1975.**

CRONIN, W. B., *see* Gross, M. G., 1.

CROUSE, H. L.

1. Chemical and mineralogical interaction of acid mine drainage with stream sediment, Babb Creek, Tioga County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1977.**

CROWL, GEORGE H.

1. Pleistocene geology and unconsolidated deposits of the Delaware Valley, Matamoras to Shawnee on Delaware, Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 60, 40 p., illus. including geologic map, **1971.** Pleistocene history, surficial deposits, physical features, and mineral resources are discussed. A surficial geologic map is included.
2. The late Wisconsinan border in northeast Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 11, **1972.**
3. The Wisconsinan border in northeast Pennsylvania: New York Glaciogram, v. 7, no. 1, p. 18–19, **1972** [not seen].
4. The style of the late Wisconsinan glacial border in northeast Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 42–43, **1975.**

5. (and Stuckenrath, R., Jr.). Geological setting of the Shawnee-Minisink paleoindian archeological site (36-Mr-43) [Monroe County], *in* Newman, W. S., and Salwen, Bert, eds., Amerinds and their paleoenvironments in northeastern North America: New York Academy of Sciences Annals, v. 288, p. 218–222, illus., **1977.** The site is located at the confluence of the Delaware River and Brodhead Creek, in the Stroudsburg quadrangle. The alluvial history following deglaciation and the time interval between glaciation and occupation of the site are reviewed.

See also Sevon, William D., 12.

CRUMP, LULIE H.

1. (and Readling, C. L.). Fuel and energy data—United States by states and regions, 1972: U.S. Bureau of Mines Information Circular 8647, 82 p., illus., **1974.** Reserves, production, and consumption of fuels and energy are summarized for household-commercial, industrial, transportation, electric power, and miscellaneous uses. Petroleum consumption is itemized by product.
2. Fuels and energy data: United States by states and census divisions, 1973: U.S. Bureau of Mines Information Circular 8722, 112 p., illus., **1976.** See annotation in entry 1 above.
3. Historical fuels and energy consumption data, 1960–72, United States by states and census districts east of the Mississippi: U.S. Bureau of Mines Information Circular 8704, 456 p., **1976.** See annotation in entry 1 above.
4. Fuels and energy data: United States by states and census divisions, 1974: U.S. Bureau of Mines Information Circular 8739, 163 p., illus., **1977.** See annotation in entry 1 above.

CUFFEY, ROGER J.

1. (and Lutz-Garihan, A. B., and Garihan, J. M.). The Hollidaysburg mastodon (Proboscidea, Pleistocene, Pennsylvania) [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 6, p. 504–505, **1974.**
2. (and Lutz-Garihan, A. B., Garihan, J. M., and Fonda, S. S.). The Hollidaysburg and Frankstown mastodons, Ice-Age elephants in central Pennsylvania: Earth and Mineral Sciences, v. 45, no. 6, p. 41–44, illus., **1976.** The fragmentary skeletal remains provide insight to the life and environment in central Pennsylvania during Late Pleistocene time. The site is reviewed, and the geochronologic and environmental implications of the find are discussed.
3. (and Davidheiser, C. E.). Paleoecologic zonation within a mid-Silurian (Rochester Shale) patch reef near Lock Haven, central Pennsylvania [Clinton County] [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 9, **1979.**

See also Krajewski, Stephen A., 5, 6.

CULLINAN, MIKE

1. (and Speece, Jack, compilers and eds.). The caves of Huntingdon County, Pennsylvania: National Speleological Society, Mid-Appalachian Region, Bulletin 9, 113 p., illus., **1975.** Ninety-four caves are listed and plotted on a location map. A description is given for each cave, including location by latitude and longitude and 7½-minute topographic quadrangle. Maps are included for some caves.

See also Speece, Jack H., 1.

CUNNINGHAM, CATHRYN E.

1. (and Aleu, M. O.). Geology of the Greentree area [Lancaster County]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1974.**

CUNNINGHAM, H. N., JR., *see* Masteller, E. C., 1.

CUNNINGHAM, ROBERT L.

1. (and Ciolkosz, E. J., Petersen, G. W., Matelski, R. P., Pennock, R., Jr., Shipp, R. F., Kuhl, A. D., Ratcliff, I. W., Jr., Lipscomb, G. H., Peechatka, W. N., and Schadel, A.). Soils of Pennsylvania: Pennsylvania State University, College of Agriculture, Agricultural Experiment Station Progress Report 365, 24 p., illus. including soils map, **1977.** There are over 300 different kinds of soil in Pennsylvania. The purpose of this publication is to introduce the soils and their characteristics.

See also Carey, J. B., 1; Ciolkosz, Edward J., 2, 3; Mathews, H. L., 1, 2; Petersen, Gary W., 1; Ranney, Richard W., 1, 2.

CURTH, ERNEST A., *see* Moebs, Noel N., 1.

CURTIS, C. E.

1. (and Hartman, R. R.). Integration of airborne magnetic and gamma-ray spectrometer data for uranium exploration in eastern Appalachians [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 5, p. 845, **1979.**

CUTCLIFFE, WILLIAM E.

1. The role of applied geology in producing high friction aggregate, *in* Hoover, K. V., ed., Proceedings, Fifth Forum on Geology of Industrial Minerals [Harrisburg, Pa., 1969]: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 64, p. 105–117, **1970.** A review of the problem of skid resistance of asphaltic pavement and the role of geology in helping to find solutions.

CYBRIWSKY, ZENON A.

1. (and Alexander, S. S.). Lg spectral excitation for earthquakes in the south-central Appalachians [abs.]: Earthquake Notes, v. 49, no. 3, p. 11–12, **1978.**
2. Spectral excitation of Lg within the south-central Appalachian region: University Park, Pennsylvania State University, M.S. thesis, **1979.**

DACHILLE, FRANK, *see* Lowright, Richard H., 3.

DAHL, H. D.

1. (and Parsons, R. C.). Ground control studies in the Humphrey no. 7 mine, Christopher Coal Div., Consolidation Coal Co.: Society of Mining Engineers of AIME Transactions, v. 252, p. 211–222, illus., **1972.** In order to improve roof stability, research was directed toward (1) defining the geological parameters that affect the severity of roof conditions at the mine, and (2) defining why roof falls in the mine (and in coal-mining areas of northern West Virginia and southwestern Pennsylvania) occur primarily in north-south-trending rooms or entries.
2. (and Choi, D. S.). Some case studies of mine subsidence and its mathematical modeling: Symposium on Rock Mechanics, 15th, Proceedings, p. 1–21, illus., **1975** [not seen].

DAHLBERG, ERIC C., *see* Rose, Arthur W., 2.

DALLMEYER, R. D., *see* Sutter, J. F., 1.

DALY, PHILIP J., *see* Inners, Jon D., 10.

DANIELS, DAVID L.

1. New gravity map of the Baltimore 2° sheet (1:250,000 series), Md., Va., W. Va., Pa. [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 17–18, **1974.**

D'APPOLONIA, E., *see* Palmer, E. C., 1.

E. D'APPOLONIA CONSULTING ENGINEERS, INC.

1. Report—Feasibility study, Domestic water quality and supply, Creekside Water Company, Creekside, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 107–2, 38 p., illus., **1972.** Due to the sealing of Ernest mine as a means of controlling mine drainage to surface water, the quality of groundwater significantly degraded in nearby Creekside. The water quantity and quality available to the Creekside Water Company are evaluated, and recommendations for solving the contamination problems are presented.
2. Mine drainage abatement survey, Cucumber Run watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 138, 16 p., illus., **1975.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
3. Mine drainage abatement survey, Langeloth-Francis mine complex, Raccoon Creek watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 130, 23 p., illus., **1975.** See annotation in entry 2 above.
4. Mine drainage abatement survey, State Game Lands No. 117: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 130–1, 10 p., unpaginated appendix, illus., **1979.** See annotation in entry 2 above.

DARLING, JOAN S., *see* Thomson, Keith S., 3.

DARRAH, WILLIAM C.

1. Historical aspects of the Permian flora of Fontaine and White, *in* Barlow, J. A., ed., I. C. White Memorial Symposium [Morgantown, W. Va., 1972]—the age of the Dunkard: Symposium Abstracts and Reference Papers, West Virginia Geological and Economic Survey, p. 1–4, **1972.** Rather than provide an answer to the Dunkard age problem, new evidence has shown the complexity of the Dunkard sedimentation and its fossil plant and animal life.
2. Pithole, the vanished city: private printing, 252 p., illus., **1972.** A history of Pithole, Pennsylvania's fabulous oil boom town, which sprang up in Venango County in 1865. Today not one building remains.
3. (and Barlow, J. A.). Fossil plants of the Waynesburg coal and Cassville Shale at Mount Morris, Pennsylvania, *in* Arkle, Thomas, Jr., field trip director, Guidebook, I. C. White Memorial Symposium field trip, September 27–29, 1972: West Virginia Geological and Economic Survey, p. 14–16, **1972.** A list of the plant fossils found in a Waynesburg coal strip mine in Greene County is given. These plants are characterized as a *Neuropteris* floral facies, and are considered to be part of the Pennsylvanian-Permian transition zone.

DAVIDHEISER, CAROLYN E., *see* Cuffey, Roger J., 3.

DAVIES, THOMAS D., *see* Raymond, Robert, Jr., 2.

DAVIES, WILLIAM E.

1. Landslide susceptibility map of part of the Bridgeville 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-274, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
2. Landslide susceptibility map of part of the Canonsburg 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-275, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
3. Landslide susceptibility map of part of the Curtisville 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-276, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
4. Landslide susceptibility map of part of the Donora 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-277, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
5. Landslide susceptibility map of part of the Freeport 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-278, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
6. Landslide susceptibility map of part of the Monongahela 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-281, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
7. Landslide susceptibility map of part of the Murrysville 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-282, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
8. Landslide susceptibility map of part of the New Kensington East 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-283, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
9. Landslide susceptibility map of the Braddock 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-273, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
10. Landslide susceptibility map of the Glassport 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-279, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
11. Landslide susceptibility map of the McKeesport 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-280, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
12. Landslide susceptibility map of the New Kensington West 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-284, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
13. Map of land modified by man in part of the Bridgeville 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-286, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
14. Map of land modified by man in part of the Canonsburg 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-287, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
15. Map of land modified by man in part of the Curtisville 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-288, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
16. Map of land modified by man in part of the Donora 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-289, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].

17. Map of land modified by man in part of the Freeport 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–290, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
18. Map of land modified by man in part of the Monongahela 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–293, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
19. Map of land modified by man in part of the Murrysville 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–294, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
20. Map of land modified by man in part of the New Kensington East 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–295, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
21. Map of land modified by man in the Braddock 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–285, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
22. Map of land modified by man in the Glassport 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–291, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
23. Map of land modified by man in the McKeesport 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–292, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
24. Map of land modified by man in the New Kensington West 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–296, 8 p., 1 pl., scale 1:24,000, **1974** [not seen].
25. (and Pomeroy, J. S., and Kohl, W. R.). Map of coal-mining features, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF–685–C, scale 1:50,000, 2 sheets, **1976** [not seen].
26. (and Ohlmacher, G. C., and Pomeroy, J. S.). Landslides and related features, Ohio, West Virginia, and Pennsylvania—Canton 1° by 2° sheet: U.S. Geological Survey Open-File Report 78–1057, 118 pls., **1978** [not seen].
27. Landslides on the Appalachian Plateaus [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 9–10, **1979.**

See also Briggs, Reginald P., 5; Pomeroy, John S., 22, 23, 41.

DAVIS, A., *see* Reyes-Navarro, Jaime, 2; Spackman, W., 1.

DAVIS, ALAN, *see* Hoover, David S., 1; Hower, James C., 3; Levine, Jeffrey R., 1.

DAVIS, PHILIP A., JR.

1. Trace element model studies of Late Precambrian-Early Paleozoic greenstones of Virginia, Maryland and Pennsylvania: Lexington, University of Kentucky, Ph.D. thesis, **1977**; [abs.], Dissertation Abstracts International, v. 39, no. 6, p. 2703B, **1978.**
2. (and Blackburn, W. H., and Brown, W. R.). Genesis of Catoctin volcanic rocks by a mantle-derived magma plume [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 4, p. 166, **1978.**

DAYTON, GORDON O.

1. (and White, W. B., compilers and eds.). The caves of Centre County, Pa.: National Speleological Society, Mid-Appalachian Region, Bulletin 11, 126 p., illus., **1979.** Seventy-one caves are listed and described. Maps for many of the caves are included.

DEAN, BRUCE

1. (and Monahan, John). The effect of land utilization on surface water in the Buffalo Valley, central Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

DEAN, STUART L., *see* Kulander, Byron R., 1.

DEGENS, EGON T.

1. (and Williams, E. G., and Keith, M. L.). Environmental studies of Carboniferous sediments, Part II: Application of geochemical criteria, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 121–136, illus., **1979** [reprinted from American Association of Petroleum Geologists Bulletin, v. 42, no. 5, p. 981–997, 1958].

DEIN, J., *see* Alexander, Shelton S., 1.

DEINES, PETER

1. (and Langmuir, Donald, and Harmon, R. S.). Stable carbon isotope ratios and the existence of a gas phase in the evolution of carbonate ground waters: Geochimica et Cosmochimica Acta, v. 38, no. 7, p. 1147–1164, illus., **1974.** Model computations show significantly different relationships between Ca^{2+} plus Mg^{2+}, HCO_3 _, pH, and ^{13}C content, depending on whether carbonate solution occurs in the presence of a gas phase. Applying this to the Nittany Valley, Centre County, carbonate-rock solution there probably occurs chiefly in the absence of a gas phase.
2. Using stable isotopes to learn more about Pennsylvania groundwaters: Earth and Mineral Sciences, v. 48, no. 4, p. 25, 29–30, illus., **1979.** Hydrologic methods being used to study groundwater are reviewed. By using stable isotopes, scientists are able to obtain information otherwise not available about hydrologic processes.

See also Harmon, Russell S., 6; Herrick, David C., 1; Hull, Laurence C., 2, 3; Sears, Stephen O., 1, 3.

DELTA ASSOCIATES

1. Mahoning Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 173, 82 p., variously paginated appendices, illus., **1973.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

DeMASTER, D. J., *see* Nozaki, Y., 1.

DEMMON, F. E., III

1. Investigations of the origins and metamorphic history of Pre-Cambrian gneisses, Downingtown 7½-minute quadrangle, southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, M.S. thesis, **1977.**

DENNISON, JOHN M.

1. (and Textoris, D. A.). Devonian Tioga tuff in northeastern United States: Bulletin Volcanologique, v. 34, no. 1, p. 289–294, illus., **1970.** The Tioga bentonite ranges from a coarse crystal tuff to a tuffaceous shale enclosed in marine strata. It

originally was deposited over the entire northeastern United States during Middle Devonian time. Outcrops occur in the Valley and Ridge province of Pennsylvania.

2. (ed.). Stratigraphy, sedimentology, and structure of Silurian and Devonian rocks along the Allegheny Front in Bedford County, Pennsylvania, Allegany County, Maryland, and Mineral and Grant Counties, West Virginia: Annual Field Conference of Pennsylvania Geologists, 37th, Bedford, Pa., Guidebook, 114 p., illus., **1972.** Structural and stratigraphic problems of the Allegheny Front are reviewed and the various types of research are discussed. The geology of the Allegheny Front is traced from Pennsylvania southward across Maryland to West Virginia, and the regional continuity of stratigraphic and structural trends is demonstrated.
3. (and de Witt, Wallace, Jr.). Redbed zone produced by sea level drop at beginning of Devonian Cohocton Age delimits Fulton and Augusta lobes of Catskill delta complex, *in* Dennison, J. M., ed., Stratigraphy, sedimentology, and structure of Silurian and Devonian rocks along the Allegheny Front in Bedford County, Pennsylvania, Allegany County, Maryland, and Mineral and Grant Counties, West Virginia: Annual Field Conference of Pennsylvania Geologists, 37th, Bedford, Pa., Guidebook, p. 109–114, illus., **1972.** The red-bed marker zone defines the lateral extent of discrete delta lobes in Virginia, West Virginia, Maryland, and Pennsylvania. Absence of the zone defines an intervening area, Grant Bay.
4. Metamorphic origin of slaty cleavage in eastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 7, p. 724, **1974.**
5. Uranium possibilities in Appalachians [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1891–1892, **1974.**
6. (and Hasson, K. O.). Lithostratigraphic nomenclature recommendations for Devonian Hamilton Group in southern Pennsylvania, Maryland, and the Virginias [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 18, **1974.**
7. (and Head, J. W.). Sealevel variations interpreted from the Appalachian basin Silurian and Devonian: American Journal of Science, v. 275, no. 10, p. 1089–1120, illus., **1975.** Summary of stratigraphic, sedimentologic, petrographic, and paleontologic evidence for Appalachian region Silurian and Devonian shoreline migration and regional water depth changes because of sea-level fluctuations.
8. Gravity tectonic removal of cover of Blue Ridge anticlinorium to form Valley and Ridge province: Geological Society of America Bulletin, v. 87, no. 10, p. 1470–1476, illus., **1976.** Arguments are presented to support the theory that the anticlinorium configuration of the Blue Ridge area did not develop until after deposition of the Paleozoic strata in the Appalachian basin.
9. (and Dever, G. R., Jr.). Energy resource implications of 38th parallel lineament across Appalachian basin [abs.]: American Association of Petroleum Geologists Bulletin, v. 60, no. 9, p. 1619, **1976.**
10. (and Hasson, K. O.). Stratigraphic cross section of Hamilton Group (Devonian) and adjacent strata along south border of Pennsylvania: American Association of Petroleum Geologists Bulletin, v. 60, no. 2, p. 278–287, illus., **1976.** The cross section shows the strata between the top of the Oriskany Sandstone and the base of the Brallier Formation. The section illustrates facies changes and thickness relations of the following formations and their members: Needmore Shale, Huntersville Chert, Marcellus Shale, Mahantango Formation, Harrell Shale, Millboro Shale, and Brallier Formation.
11. Bibliographic index of Appalachian basin theses and dissertations through 1975: Charleston, W. Va., Appalachian Geological Society, 295 p., **1977.** There are

3,091 listings from 108 schools. All aspects of the geosciences in the geographic area of the Appalachian basin are included. The Triassic basin of Pennsylvania is also included.

12. Origin of keel-line peridotites in the Appalachian basin [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 387–388, **1978.**
13. (and Hasson, K. O., Hoskins, D. M., Jolley, R. M., and Sevon, W. D.). Devonian shales in south-central Pennsylvania and Maryland: Annual Field Conference of Pennsylvania Geologists, 44th, Bedford, Pa., Guidebook, 116 p., illus., **1979.** This field conference emphasized the correlations and depositional environments of the Devonian shales. Field relationships focused on south-central Pennsylvania in order to show facies changes eastward toward the source of the marine detrital clastics. The stratigraphic relationships and nomenclatural changes among the Brallier Formation, Harrell and Burket Shales, Tully Limestone, and Mahantango Formation were demonstrated at 13 stops.

See also de Witt, Wallace, Jr., 3; Hasson, Kenneth O., 2, 3, 4, 6, 7.

DENNY, CHARLES S., *see* Ray, Clayton E., 1.

DENSMORE, NEAL W.

1. (and Ziegler, R. L.). The Thompson Rockshelter (36-Ve-76): Pennsylvania Archaeologist, v. 41, no. 1–2, p. 15–29, illus., **1971.** Description of the excavation of a well-protected rockshelter with a shallow solum in Venango County. No stratigraphic arrangement was discernible.

DEPMAN, A. J.

1. (and Parrillo, D. G., Lazor, R. G., Smith, B. L., and Hooke, A. L.). Engineering geology in northeastern Pennsylvania and New Jersey: Association of Engineering Geologists, Annual Meeting, 1970, Field Trip 2, Guidebook, 32 p., illus., **1970.** The geology, design, and construction of the Beltzville, Penn Forest, and Tocks Island dam sites are briefly discussed.

De ROSE, WILLIAM R.

1. A programmed unit for the Middle School student on plate tectonics: University Park, Pennsylvania State University, M.Ed. thesis, **1978.**

DERSTLER, KRAIG L.

1. Carpoid echinoderms from Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 48, **1975.**
2. (and Price, J. W.). The Lower Devonian echinoderm *Anomolocystites* in Pennsylvania: Pennsylvania Geology, v. 6, no. 2, p. 7–9, illus., **1975.** A large and varied collection of Lower Devonian marine fossils was found in the sandstone of the Old Port Formation in Centre County. At least 40 species of animals were recorded from this formation.

See also Wright, Thomas O., 3.

De SANTIS, JOHN E.

1. The petrology of the ultramafic rocks in the Wissahickon Formation, Philadelphia: Philadelphia, Temple University, M.S. thesis, **1978.**
2. (and Myer, G. H.). Fragments of ophiolite ultramafic cummulate in the Wissahickon Schist of the Philadelphia area [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 40, **1978.**

See also Myer, George H., 1.

DEUL, MAURICE

1. Coalbed derived natural gas in conventional gasfields [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 51, **1979.**

See also McCulloch, Charles M., 1, 2, 3; Moore, T. D., Jr., 1.

DEURBROUCK, A. W., *see* Cavallaro, J. A., 1; Zeilinger, J. E., 2.

DEVER, GARLAND R., JR., *see* Dennison, John M., 9.

DEVINE, JAMES F., *see* Hadley, Jarvis B., 1.

DEWEY, JOHN F., *see* Bird, John M., 1.

DeWINDT, J. THOMAS

1. Vertebrate fossils as paleocurrent indicators in the Upper Silurian of the central Appalachians: Compass, v. 49, no. 4, p. 125–137, illus., **1972.** *In situ* bonebeds in the Bloomsburg Formation containing preferentially oriented, imbricated ostracoderm cephalic shields indicate the usefulness of those fossils as paleocurrent indicators, especially inasmuch as the indicated direction (S54°W) is in good accord with previously established results. Paleoenvironments of the Landisburg tongue of the Bloomsburg magnafacies are also discussed.
2. Occurrence of *Rusophycus* in the Poxono Island Formation (Upper Silurian) of eastern Pennsylvania: Journal of Paleontology, v. 47, no. 5, p. 999–1000, illus., **1973.** Both the genetic association of this trace fossil with trilobites and its stratigraphic context suggest a shallow marine environment of deposition of the enclosing strata.
3. The Landisburg tongue of central Pennsylvania: a Late Silurian delta: Pennsylvania Academy of Science Proceedings, v. 47, p. 25–29, illus., **1973.** This sandstone unit, confined to Perry County, averages 15 feet in thickness. The fossil vertebrates (ostracoderms) are reviewed in this paleoenvironmental investigation.
4. Acanthodian scales from the Bloomsburg Formation (?Middle and Upper Silurian) of central Pennsylvania: Journal of Paleontology, v. 48, no. 3, p. 594–595, illus., **1974.** The distinctive forms of 12 Pennsylvanian fossils typical of the scales of acanthodian fishes are described.

de WITT, WALLACE, JR.

1. Age of the Bedford Shale, Berea Sandstone, and Sunbury Shale in the Appalachian and Michigan basins, Pennsylvania, Ohio, and Michigan: U.S. Geological Survey Bulletin 1294-G, 11 p., illus., **1970.** The Cussewago (Murrysville) Sandstone contains an *Adiantites* flora in central Pennsylvania, indicating an Early Mississippian (Kinderhookian) age. The black *Siphonodella*-bearing Sunbury Shale of Kinderhookian age overlies the Berea Sandstone in the northwestern Appalachian basin and the eastern Michigan basin.
2. The Mifflintown Formation of Middle Silurian age, Bedford County, Pennsylvania, *in* Cohee, G. V., and others, Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1970: U.S. Geological Survey Bulletin 1354-A, p. 28–29, **1971.** The Mifflintown Formation is described and the name is formally adopted by the U.S. Geological Survey.
3. (and Dennison, J. M.). The Allegheny Front from Bedford County, Pennsylvania to Grant County, West Virginia, *in* Dennison, J. M., ed., Stratigraphy, sedimentology, and structure of Silurian and Devonian rocks along the Allegheny Front in Bedford County, Pennsylvania, Allegany County, Maryland, and Mineral and

Grant Counties, West Virginia: Annual Field Conference of Pennsylvania Geologists, 37th, Bedford, Pa., Guidebook, p. 14–32, illus., **1972.** The Allegheny Front is a conspicuous escarpment, generally having more than 1,000 feet of relief, composed of rocks ranging in age from Devonian to Pennsylvanian. Detailed mapping during the past 20 years has provided the data necessary to document the existence of several thrust faults of considerable stratigraphic displacement and geographic extent.

4. Geologic map of the Beans Cove and Hyndman quadrangles and part of the Fairhope quadrangle, Bedford County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-801, 6 p., 1 pl., scale 1:24,000, **1974.** Units ranging in age from Cambrian to Quaternary have been mapped. The economic geology and geologic hazards are summarized in an accompanying pamphlet.
5. Petroleum potential of Appalachian basin [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1892, **1974.**
6. Oil and gas data from the Upper Paleozoic rocks in the Appalachian basin: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-917-A, scale 1:2,500,000, 4 sheets, **1975.** See annotation in entry 7 below.
7. (and Perry, W. J., Jr., and Wallace, L. G.). Oil and gas data from the Devonian and Silurian rocks in the Appalachian basin: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-917-B, scale 1:2,500,000, 4 sheets, **1975.** The maps, charts, and cross sections show the results of a survey of the subsurface data in the Appalachian basin, including Pennsylvania.
8. (and Cohee, G. V., and McGrew, L. W.). Oil and gas in Mississippian rocks in part of eastern United States, *in* Craig, L. C., and others, Paleotectonic investigations of the Mississippian System in the United States—Part II, Interpretive summary and special features of the Mississippian System: U.S. Geological Survey Professional Paper 1010-U, p. 441–455, illus., **1979.** The Murrysville and Berea sands of western Pennsylvania are included in the description.
9. (and Kepferle, R. C., Roen, J. B., Wallace, L. G., and West, Mareta). Preliminary correlation of Devonian black shales in the Appalachian basin, *in* McGinley, F. E., chairperson, Chattanooga Shale Conference [Oak Ridge, Tenn., 1978]: U.S. Department of Energy Report GJBX-170(79), p. 13–14, **1979.** A summary of the stratigraphy of the Devonian black shales, including the Harrell Shale in Pennsylvania.
10. (and McGrew, L. W.). The Appalachian basin region, *in* Craig, L. C., and Connor, C. W., coordinators, Paleotectonic investigations of the Mississippian System in the United States—Part I, Introduction and regional analyses of the Mississippian System: U.S. Geological Survey Professional Paper 1010-C, p. 13–48, illus., **1979.** The tectonic framework of the Appalachian basin during the Mississippian Period consisted of an eastern, arcuately elongate, miogeosynclinal segment. Mississippian rocks in the basin are locally more than 7,000 feet thick.

See also Dennison, John M., 3; Harris, Leonard D., 2; Roen, John B., 8, 9, 10; Wallace, Laure G., 1, 2.

DEXTER, RALPH W.

1. Local societies of Schuylkill County and research on the coal fields of Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 51–52, **1979.**

DeYOUNG, JOHN H., JR., *see* Ridge, John D., 2.

DIAMOND, W. PATRICK

1. (and McCulloch, C. M., and Bench, B. M.). Estimate of coal-cleat orientation using surface-joint and photolinear analysis: Geology, v. 3, no. 12, p. 687–690, illus., **1975.** Coal-cleat orientation estimates in the Pittsburgh coal in Washington and Greene Counties are reliable at a regional level using infrared photolinear analysis and at a local level using surface-joint analysis.
2. (and McCulloch, C. M., and Bench, B. M.). Use of surface joint and photolinear data for predicting subsurface coal cleat orientation: U.S. Bureau of Mines Report of Investigations 8120, 13 p., illus., **1976.** The determination of cleat orientation in coal beds for such purposes as degasification is discussed.
3. (and Murrie, G. W.). Methane gas content of the Pittsburgh coalbed and evaluation drilling results at a major degasification installation [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 256, **1977.**

See also Bench, Bernard M., 1; McCulloch, Charles M., 3.

DICKEY, PARKE A.

1. (and Hunt, J. M.). Geochemical and hydrogeologic methods of prospecting for stratigraphic traps, *in* King, R. E., Stratigraphic oil and gas fields—Classification, exploration methods, and case histories: American Association of Petroleum Geologists Memoir 16, p. 136–167, illus., **1972.** The geology of the Drake oil well is outlined.

DICKSON, PETER A.

1. Permo-Carboniferous non-marine Bivalvia of the Appalachian basin: their adaptive strategies and stratigraphical utility: University of Pittsburgh, Ph.D. thesis, **1977;** [abs.], Dissertation Abstracts International, v. 38, no. 9, p. 4132B, **1978.**

DIEHL, JOHN R.

1. Environmental geology of Wertzville and Duncannon quads.: Morgantown, West Virginia University, M.S. thesis, **1977.**

DIERKS, HENRY A.

1. (and Whaite, R. H., and Harvey, A. H.). Three mine fire control projects in northeastern Pennsylvania: U.S. Bureau of Mines Information Circular 8524, 53 p., illus., **1971.** The methods used and costs involved in controlling mine fires in the anthracite region are presented. Boreholes are the most effective means of obtaining subsurface data.

DIMENT, W. H., *see* Muller, Otto H., 1.

DIVINEY, JOHN G.

1. Construction of Interstate-81 embankment over abandoned Harrisburg city dump, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 156–173, illus., **1978.** The geologic problems associated with land previously used for a landfill and now needed for highway construction are reviewed.
2. Landslide in colluvium—Interstate 81, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 145–155, illus., **1978.** Includes a discussion of the geology associated with, cause of, and remedial work necessary to repair a landslide in Cumberland County.
3. Ridge and Valley physiographic province of Pennsylvania, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 117–144, illus., **1978.** Includes

a review of the geotechnical projects in the Valley and Ridge province, the geologic problems encountered, and the solutions.

DIXON, J. A., *see* Zielinski, R. E., 1.

DOBECKI. THOMAS, *see* Coon, Julian B., 1.

DODGE, CLIFFORD H., *see* Buckwalter, Theodore F., 1.

DODIN, STEVEN F., *see* Donahue, Jack D., 2, 4.

DONAHUE, JACK D.

1. (and Rollins, H. B., and Shaak, G. D.). Asymmetrical community succession in a transgressive-regressive sequence, *in* Paleontology: International Geological Congress, 24th, Montreal, Canada, 1972, Proceedings, Sec. 7, p. 74–81, illus., **1972;** [abs.], International Geological Congress, 24th, Montreal, Canada, 1972, Abstracts, p. 222, **1972.** An abandoned strip mine in Fayette County was the study area for a new model of faunal succession in the Brush Creek limestone.
2. (and Dodin, S. F.). A possible model for teaching environmental geology—a new environmental course in Allegheny and Westmoreland Counties, Pa. [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 155–156, **1973.**
3. (and Rollins, H. B.). Conemaugh (Glenshaw) marine events: American Association of Petroleum Geologists, Eastern Section, Annual Meeting, 3rd, and Society of Economic Paleontologists and Mineralogists, Eastern Section, Spring Field Trip, Pittsburgh, Pa., Guidebook, 47 p. plus variously paginated articles, illus., **1974.** Channel deposits, overbank shales, freshwater-lake deposits, red beds, marine events, and associated depositional environments are reviewed. Includes papers by other contributors which are annotated separately.
4. (and Rollins, H. B., Dodin, S. F., and Carothers, Marshall). Beware the productid pseudoolite machine!, *in* Donahue, J., and Rollins, H. B., Conemaugh (Glenshaw) marine events: American Association of Petroleum Geologists, Eastern Section, Annual Meeting, 3rd, and Society of Economic Paleontologists and Mineralogists, Eastern Section, Spring Field Trip, Pittsburgh, Pa., Guidebook, p. E1–E3, illus., **1974.** While examining many thin sections from marine limestones of the Conemaugh Group of Pennsylvania and Ohio, the authors discovered that isolated productid brachiopod spines can easily be mistaken for oolitically coated grains.
5. (and Adovasio, J. M., Gunn, J. D., and Stuckenrath, R.). Meadowcroft Rockshelter: evidence for human occupation back to 16,000 B.P. [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 163, **1976.**
6. (and Adovasio, J. M., Gunn, J. D., and Stuckenrath, R.). Sedimentologic investigations at Meadowcroft Rockshelter [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 390–391, **1978.**
7. (and Storck, P. L., Adovasio, J. M., and others). Archaeological sites; Pittsburgh to Toronto, *in* Currie, A. L., and others, eds., Toronto, '78 field trips—Guidebook: Toronto, Canada, Geological Association of Canada, p. 65–79, illus., **1978** [not seen].
8. (and Stuckenrath, R., Adovasio, J. M., and others). Meadowcroft Rockshelter, *in* Bryan, A. L., ed., Early man in America; from a circum-Pacific perspective: University of Alberta, Department of Anthropology, Occasional Paper 1, p. 140–180, illus., **1978** [not seen].
9. (and Adovasio, J. M., and Stuckenrath, R.). Meadowcroft Rockshelter: geologic investigations, *in* Donahue, Jack, and Rollins, H. B., eds., Geology of the northern

Appalachian coal field: International Congress of Carboniferous Stratigraphy and Geology, 9th, Field Trip 2, Guidebook, University of Pittsburgh and Pittsburgh Geological Society, p. E1-E3, 38, 39, **1979.** The stratigraphy, petrography, sediment sources, and radiocarbon chronology of the site are summarized.

10. (and Rollins, H. B.). Depositional environments and paleogeography of lower Conemaugh marine units in western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 10, **1979.**
11. (and Rollins, H. B., eds.). Geology of the northern Appalachian coal field: International Congress of Carboniferous Stratigraphy and Geology, 9th, Field Trip 2, Guidebook, University of Pittsburgh and Pittsburgh Geological Society, variously paginated, illus., **1979.** Localities that illustrated typical coal deposits for the area were visited. Depositional environments for the coal and associated sediments and the technology involved in coal extraction, processing, and conversion are discussed. Areas visited also included examples of the various depositional styles.

See also Adovasio, J. M., 1, 2, 3; Cain, Bruce, 2; Payne, Michael A., 1; Rollins, Harold B., 2.

DONALDSON, ALAN C.

1. Pennsylvanian sedimentation of central Appalachians, *in* Briggs, Garrett, ed., Carboniferous of the southeastern United States: Geological Society of America Special Paper 148, p. 47-78, illus., **1974.** The Pennsylvanian rocks of the central Appalachians record a progressive change in paleogeography and paleoenvironment, from extensive sea, to relatively small bay, to entirely river influenced low-salinity bay-lake, to relatively small lakes of a fluvial plain.
2. (and Presley, M. W., and Renton, J. J., eds.). Field trip guidebook for Carboniferous coal short course: West Virginia Geological and Economic Survey Bulletin B-37-2, 174 p., illus., **1979.** The authors mainly discuss the stratigraphy and depositional history of the Carboniferous rocks in the Morgantown area of West Virginia. However, portions of southern Greene County are included in the discussion, and cross sections and maps of the area are shown.
3. (and Renton, J. J., Kimutis, Robert, Linger, Daniel, and Zaidi, Mohammad). Distribution pattern of total sulfur content in an Appalachian coal [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 414, **1979.**
4. (and Renton, J. J., Kimutis, Robert, Linger, Daniel, and Zaidi, Mohammed). Distribution pattern of total sulfur content in the Pittsburgh coal, *in* Donaldson, A. C., and others, eds., Carboniferous coal short course and guidebook: Volume 3: West Virginia Geological and Economic Survey Bulletin B-37-3, Supplement, p. 143-181, illus., **1979.** Variations in the sulfur content of the Pittsburgh coal are studied in terms of the stratigraphic distribution of the sulfur within the coal and the relationship, if any, to the nature of the seat rock, coal partings, or roof rock.
5. (and Shumaker, R. C.). Late Paleozoic molasse of central Appalachians, *in* Donaldson, A. C., and others, eds., Carboniferous coal short course and guidebook: Volume 3: West Virginia Geological and Economic Survey Bulletin B-37-3, Supplement, p. 1-42b, illus., **1979.** Episodes of deformation in the eastern United States and their effects on Paleozoic sedimentation are discussed. The occurrence of natural gas is explained, along with the tectonic influence on coal formation.

DONATH, FRED A.

1. Faulting across discontinuities in anisotropic rock, *in* Stability of rock slopes: Symposium on Rock Mechanics, 13th, Proceedings, p. 753-772, illus., **1972** [not seen].

DONAVEN, DONALD J., *see* Gomez, Manuel, 2, 3.

DORSEY, ROGER A.

1. The morphology of Bowery Run drainage basin and related studies: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1974.**

DORT, WAKEFIELD, JR., *see* Aber, James S., 2.

DOSSERT, WILLIAM P., *see* Chamberlain, Steven C., 1.

DOTY, W. T., *see* Baker, D. E., 1.

DOUGHERTY, MURRAY T.

1. (and Barsotti, N. J.). Structural damage and potentially expansive sulfide minerals: Association of Engineering Geologists Bulletin, v. 9, no. 2, p. 105–125, illus., **1972** [not seen].

DOUGLAS, LOWELL A., *see* Novak, Robert J., 1.

DOUGLASS, RAYMOND C.

1. The distribution of fusulinids and their correlation between the Illinois basin and the Appalachian basin, *in* Palmer, J. E., and Dutcher, R. R., eds., Depositional and structural history of the Pennsylvanian System of the Illinois basin, Part 2: Invited papers: International Congress of Carboniferous Stratigraphy and Geology, 9th, Field Trip 9, Guidebook 15, pt. 2, Illinois State Geological Survey, p. 15–20, illus., **1979.** Known fusulinids from the Appalachian basin are summarized.

DOWNER, ALAN

1. The chemical composition of the Riceville and Bedford Shales: Meadville, Pa., Allegheny College, Bachelor's thesis, **1971.**

DOWNEY, WAYNE F., JR.

1. Geological conditions in burning anthracite—northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 19–20, **1974.**

See also Finkelman, Robert B., 1.

DOYLE, F. J., *see* Benson, David C., 1.

DRAKE, AVERY A., JR.

1. Structural geology of the Reading Prong, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 271–291, illus., **1970.** The fundamental problem of the area is the geometric and tectonic relationship of the Precambrian rocks to the sedimentary rocks of the Great Valley and the smaller intra-Prong valleys. Many geologists believe that the Precambrian rocks are a far-traveled allochthonous mass.
2. The Lyon Station-Paulins Kill nappe—the frontal structure of the Musconetcong nappe system in eastern Pennsylvania and New Jersey: U.S. Geological Survey Professional Paper 1023, 20 p., illus. including geologic maps, **1978.** The Lyon Station-Paulins Kill nappe, as defined by geologic mapping in tectonic windows and by aeromagnetic surveying, underlies rocks of the Musconetcong nappe and contains rocks of more shoreward facies. It is a frontal as well as a tectonically lower structure. Other far-traveled tectonic units are also recognized, and the Musconetcong nappe system is defined.
3. (and Lyttle, P. T., and Owens, J. P.). Preliminary geologic map of the Newark quadrangle, New Jersey and Pennsylvania: U.S. Geological Survey Open-File

Report 78-595, 3 p., 4 pls., **1978** [not seen].
See also Alvord, Donald C., 1; Lyttle, Peter T., 2.

DRAPER, JOHN C.

1. (and McHugh, R. E.). Warwick mine no. 2 water treatment: Mining Congress Journal, v. 58, no. 8, p. 24–28, illus., **1972.** Mine water treatment at this Greene County mine is discussed.

DREIMANIS, ALEKSIS

1. (and Goldthwait, R. P.). Wisconsin glaciation in the Huron, Erie, and Ontario lobes, *in* Black, R. F., and others, eds., The Wisconsinan Stage: Geological Society of America Memoir 136, p. 71–106, **1973.** A discussion of the Wisconsinan glacial advance into northwestern Pennsylvania is included.

DRENNAN, LAWRENCE E.

1. Deposition of middle Monongahela Group coals (Redstone-Uniontown) and associated rocks, *in* Donaldson, A. C., and others, eds., Field trip guidebook for Carboniferous coal short course: West Virginia Geological and Economic Survey Bulletin B-37-2, p. 121–157, illus., **1979.** Parts of southern Greene County are included in this West Virginia study of the depositional environment of the Redstone to Lower Uniontown coal interval of the Monongahela Group. Isopach and facies maps are shown.

DROMS, BARBARA K.

1. Landsat and land cover: an exploration in Huntingdon County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1978.**

DUBROVSKY, NEIL M.

1. Geological aspects of land use planning in Upper St. Clair Township [Allegheny County], Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 258, **1977.**

DUCHAINE, RAYMOND P.

1. Multiple fold styles in Rheems quarry, Rheems [Lancaster County], Pennsylvania: Philadelphia, Temple University, M.A. thesis, **1978.**

DULONG, F. T., *see* Cecil, C. Blaine, 1; Finkelman, Robert B., 5.

DUNLEAVY, JEFFREY M.

1. A geophysical investigation of the contact along the northern margin of the Newark Triassic basin, Hosensock, Pennsylvania to Gladstone, New Jersey: Bethlehem, Pa., Lehigh University, M.S. thesis, **1975.**
See also Sumner, John R., 4.

DUNN, PETE J.

1. (and Peacor, D. R., and Palmer, T. D.). Desautelsite, a new mineral of the pyroaurite group: American Mineralogist, v. 64, no. 1-2, p. 127–130, illus., **1979.** This mineral was first noted on specimens from San Benito County, California, where it occurs at two localities. The type locality is at the Cedar Hill quarry in Lancaster County.

DUNNING, CHARLES H.

1. Mica mine is based on a geologic freak: Engineering and Mining Journal, v. 170, no. 8, p. 103, illus., **1969.** Valley fill near Glenville [Hokes], York County, consists of 50 percent very fine muscovite, which contains 0.50 percent graphite. The

deposit is about 250 feet wide and 150 feet deep, and extends at least 1½ miles. The author theorizes that the deposit was derived from mica schist by glacial action.

DUTCHER, RUSSELL R., *see* Reidenouer, David R., 2.

DUVEL, WILLIAM A., JR.

1. (and Lalli, B. M., and Heim, J. D.). Rural water supply in Appalachia: American Water Works Association Journal, v. 66, p. 14–19, **1974.** Water-supply problems of a small, isolated, rural town in Armstrong County are typical of those in many former mining towns throughout Appalachia. Several recommendations are presented to improve the distribution system as well as the treatment process.

EAGAR, R. M. C.

1. Some nonmarine bivalve faunas from the Dunkard Group and underlying measures, *in* Barlow, J. A., and Burkhammer, Susan, eds., Proceedings of the First I. C. White Memorial Symposium [Morgantown, W. Va., 1972]—"The Age of the Dunkard": West Virginia Geological and Economic Survey, p. 23–67, **1975.** Nonmarine bivalve faunas are described from 10 to 11 horizons ranging from the middle of the Conemaugh Group to the lower limestone member of the Washington Formation. Two new species, *Anthraconaia speciosa* and *A. protracta,* are described.

EARL, J. L., *see* Chow, Tsaihwa J., 1.

EARTH SATELLITE CORPORATION

1. Use of photo interpretation and geological data in the identification of surface damage and subsidence: Appalachian Regional Commission Report ARC-73-111-2554, 104 p., illus., **1975.** Multi-sensor, multi-level remote sensing was examined to determine its utility in detecting and delineating the surface expression of mine subsidence in the Northern Anthracite field.

EARTH SCIENCE

1. Half a hundred stars: geology of the fifty states—Pennsylvania: Earth Science, v. 33, no. 1, p. 28–29, illus., **1979.** The geology of Pennsylvania is described in a summary paragraph.

EASON, J. E.

1. (and Bergenback, R. E.). Reflections on the significance of cross-bedding in ancient sandstones [abs.]: Tennessee Academy of Science Journal, v. 45, no. 2, p. 53, **1970.**
2. (and Bergenback, R. E.). Reflections on the significance of cross bedding in ancient sandstones: Tennessee Academy of Science Journal, v. 47, no. 3, p. 84–89, illus., **1972** [not seen].

EATON, ANDREW D.

1. (and Grant, Virginia, and Gross, M. G.). Geochemically tracing the transport of Susquehanna River derived particles in the Chesapeake Bay [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 394, **1978.**

EBAUGH, W. E.

1. Temperature patterns in soil above caves and fractures in bedrock: University Park, Pennsylvania State University, M.S. paper, **1973.**

EBEN, F. C., *see* Agarwal, R. K., 1.

EBY, JAMES R.

1. The geology and water resources, for land-use planning, of Potter Township, Centre County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1975.**

ECKENRODE, JOSEPH, *see* Yaworski, Michael, 1.

ECKHARDT, DAVID A. V.

1. Sediment discharge from an area of highway construction, Applemans Run basin, Columbia County, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 76–111, 25 p., illus., **1976.** The effects of highway construction on suspended-sediment discharge are evaluated for a small basin underlain by thick periglacial deposits.

See also Ward, Janice R., 3.

EDDY, GREG E.

1. Sulfur and ash distribution of Pittsburgh coal (Pennsylvanian), Mathies mine, Pennsylvania: Morgantown, West Virginia University, Ph.D. thesis, **1971;** [abs.], Dissertation Abstracts International, v. 32, no. 11, p. 6472B, **1972.**
2. The correlation of ash and sulfur in coal with thickness of the coal and paleogeography of the coal swamp [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 553, **1971.**

EDGERTON, CURTIS D., *see* Heyman, Louis, 7; Wagner, Walter R., 6.

EDMUNDS, WILLIAM E.

1. (and Berg, T. M.). Geology and mineral resources of the southern half of the Penfield 15-minute quadrangle, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 74cd, 184 p., illus. including geologic map, **1971.** The nature and occurrence of the various rock layers found at and below the surface of this area of west-central Clearfield County are described.
2. Coal reserves of Pennsylvania: total, recoverable, and strippable (January 1, 1970): Pennsylvania Geological Survey, 4th ser., Information Circular 72, 40 p., illus., **1972.** As of 1970, Pennsylvania's readily minable, recoverable reserves were 8 to 9 billion tons of deep coal and 1 billion ton of strip coal. Total recoverable reserves amounted to 9 to 10 billion tons. These figures represent about 50 years of strip mining and 150 years of deep mining at the 1970 rate of production.
3. Preliminary structure contour map of Allegheny County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report [4 p.], 1 pl., scale 1:125,000, **1974.**
4. Preliminary structure contour map of Armstrong County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report [4 p.], 1 pl., scale 1:125,000, **1974.**
5. Preliminary structure contour map of Beaver County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report [4 p.], 1 pl., scale 1:125,000, **1974.**
6. Preliminary structure contour map of Butler County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report [4 p.], 1 pl., scale 1:125,000, **1974.**
7. Preliminary structure contour map of Washington County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report [4 p.], 1 pl., scale 1:125,000, **1974.**
8. Preliminary structure contour map of Westmoreland County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report [4 p.], 1 pl., scale 1:125,000, **1974.**

9. (and Sholes, M. A., and Skema, V. W.). The economic geology of the Upper Freeport coal (Pennsylvanian) in the New Stanton area of Westmoreland Co., Pennsylvania: a model study of coal exploration [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 259, **1977.**
10. (and Berg, T. M., Sevon, W. D., Piotrowski, R. C. [sic], Heyman, Louis, and Rickard, L. V.). The Mississippian and Pennsylvanian (Carboniferous) Systems in the United States—Pennsylvania and New York: U.S. Geological Survey Professional Paper 1110-B, p. B1-B33, **1979.** A historical review and summary of the stratigraphy and areal, structural, and economic geology of Mississippian and Pennsylvanian rocks in Pennsylvania and southwestern New York.

See also Berg, Thomas M., 12; Cortis, S. E., 1; Glass, Gary B., 8; Sholes, Mark A., 3; Skema, Viktoras W., 1, 2; Wagner, Walter R., 10.

EDWARDS, R. N., *see* Bailey, R. C., 1.

EGGLESTON, JANE R.

1. Coal exploration for mine planning in a structurally complex, heavily mined region [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 395, **1978.**

EISERT, RONALD W.

1. Monongahela flint and associated workshops in the Chartiers Valley, Washington County, Pennsylvania: Pennsylvania Archaeologist, v. 44, no. 3, p. 32-39, illus., **1974.** The problem of identifying flints that prehistoric man used for his implements and locating their geologic origins has often confronted archeologists. To assist in the dissemination of information, local lithic material in the central part of the Chartiers Valley was examined.

EISTER, MARGARET F., *see* McIntosh, Willard L., 1.

EL ASHMAWI, N.

1. (and Greenfield, B. J.). A review of vertical cut slopes in flat layered rock 5 years after construction: Association of Engineering Geologists Bulletin, v. 9, no. 4, p. 395-398, illus., **1972.** Wind erosion is found to be a critical factor in preventing stabilization of vertical cut slopes through thin-bedded sedimentary rock layers.

EL-ASHRY, M. T.

1. New Devonian coral reef from Monroe County, eastern Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 45, p. 5-8, illus., **1971.** "Barton's Reef," exposed in a roadcut along Interstate Route 80 in Monroe County, is an "incipient reef" containing many well-preserved fossil corals.
2. Trace elements in Pennsylvanian shales in relation to environmental health in northeastern Pennsylvania: Geological Society of America Bulletin, v. 82, no. 5, p. 1425-1428, illus., **1971.** Thirty samples from the shales that overlie and underlie major Pennsylvanian coal beds in the Wyoming-Lackawanna Valley were chemically analyzed for chromium, nickel, and cobalt trace elements that are known to have a carcinogenic effect on human lungs.
3. (and Nejib, U. R.). Magnetic susceptibility studies of shales from Northern Anthracite field of Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 3, p. 616-617, **1972.**
4. (and Getzoff, R.). Geochemistry of Pennsylvanian shales and environmental health in northeastern Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 48, p. 24-27, illus., **1974.** The distributions of chromium, nickel, cobalt, iron,

and manganese are said to agree with the number of lung cancer cases reported among coal miners in the Wyoming-Lackawanna Valley.

5. (and Mattei, C. M.). Post-flood effects of acid-mine drainage on the water quality of the Susquehanna River system in northeastern Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 48, p. 30–34, illus., **1974.** Eleven tributaries and 10 points along a 50-mile stretch of the Susquehanna River between Tunkhannock and Mocanaqua were sampled and chemically analyzed. Improvement in water quality and a shift in acid-mine-drainage discharge points were noted.
6. Environmental effects of surface coal mining [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 852, **1976.**

EL-BARBARY, IBRAHIM, *see* McDuffie, Bruce, 1.

ELDER, CURTIS H.

1. (and Irani, M. C.). Geology and gas content of coalbeds in vicinity of Bureau of Mines, Bruceton, Pa.: U.S. Bureau of Mines Report of Investigations 8247, 22 p., illus., **1977.** Two degasification test boreholes were drilled to depths of 1,238 and 1,212 feet at Bruceton (Allegheny County). Detailed geologic information was obtained from the holes, and geologic sections were drawn.

EMRICH, GROVER H.

1. (and Merritt, G. L.). Multi-land use and solid waste disposal: Geological Society of America, Annual Meeting, Field Trip Guidebook, v. 1971, no. 6, p. 4–24, illus., **1971** [not seen].
2. (and Merritt, G. L.). Effects of mine drainage on ground water [Clarion County], *in* McKenzie, G. D., and Russell, O. U., eds., Man and his physical environment—Readings in environmental geology: Minneapolis, Minn., Burgess Publishing Company, p. 174–179, illus., **1972** [reprinted from Ground Water, v. 7, no. 3, p. 27–32, 1969].
3. (and Pitcairn, Feodor, and Witwer, David). Geologic environmental planning in a major metropolitan area [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 22–23, **1974.**
4. Land application of wastewater and residuals: policy implications, *in* Kern, W. R., ed., Public policy on ground water quality protection: Blacksburg, Va., Virginia Polytechnic Institute and State University, p. 75–89, illus., **1977.** Discussion of the three basic methods of land application: (1) overland flow, (2) infiltration-percolation, and (3) spray irrigation. Case studies are cited.

See also Merritt, Gary L., 1; Russnow, Arthur L., 1.

ENGEL, JAMES

1. The traveling naturalist goes on top: Mount Davis: Pennsylvania Naturalist, v. 2, no. 1, p. 22–23, illus., **1979.** Description of the highest point in Pennsylvania.

ENGELDER, P. RICHARD

1. The interrelationships between friability and other measured variables in the Chickies Formation: University Park, Pennsylvania State University, M.S. thesis, **1976.**

ENGINEERING MECHANICS, INC.

1. Moon Run watershed mine drainage abatement survey: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 162–1, 25 p., 33 p. appendix, illus. [no date]. This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for

abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

ENGLISH ENGINEERING CORPORATION

1. English Run watershed, Lycoming County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 160, 66 p., variously paginated appendices, illus., **1971.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

ENGLUND, KENNETH J., *see* Coleman, S. Lynn, 1.

ENGMAN, EDWIN T.

1. (and Parmele, L. H., and Gburek, W. J.). Hydrologic impact of tropical storm Agnes [abs.]: EOS (American Geophysical Union Transactions), v. 53, no. 11, p. 982, **1972.**
2. (and Parmele, L. H., and Gburek, W. J.). Hydrologic impact of tropical storm Agnes: Journal of Hydrology, v. 22, no. 1–2, p. 179–193, illus., **1974.** The East Mahantango Creek watershed in eastern Pennsylvania has dense instrument control. Data from tropical storm Agnes were analyzed with respect to watershed yield and return period frequency. Data from the 277-square-mile watershed indicate that runoff rates in the later part of the storm were approximately equal to rainfall rates.
3. (and Slawson, G. C., Jr., and Kranz, V. R.). A methodology for regional analysis of interrelated and cumulative impacts of power plant development [abs.]: EOS (American Geophysical Union Transactions), v. 57, no. 12, p. 916, **1976.**

See also Henninger, D. L., 1.

EPSTEIN, ANITA G. F.

1. Stratigraphy of uppermost Silurian and lowermost Devonian rocks and the conodont fauna of the Coeymans Formation and its correlatives in northeastern Pennsylvania, New Jersey, and southernmost New York: Columbus, Ohio State University, Ph.D. thesis, **1970;** [abs.], Dissertation Abstracts International, v. 32, no. 1, p. 376B–377B, **1971.**

See also Bergström, Stig M., 2; Epstein, Jack B., 2, 3; Harris, Anita G.

EPSTEIN, JACK B.

1. Geology of the Stroudsburg quadrangle and adjacent areas, Pennsylvania-New Jersey: Columbus, Ohio State University, Ph.D. thesis, **1970;** [abs.], Dissertation Abstracts International, v. 32, no. 1, p. 377B–378B, **1971.**
2. (and Epstein, A. G.). The Shawangunk Formation (Upper Ordovician(?) to Middle Silurian) in eastern Pennsylvania: U.S. Geological Survey Professional Paper 744, 45 p., illus., **1972.** Includes discussions of the stratigraphy, petrography, sedimentology, depositional environments, and age of the Shawangunk, a lower Paleozoic fluvial and transitional marine clastic sequence. Measured sections are also included.
3. (and Epstein, A. G., and Bergström, S. M.). Significance of Lower Ordovician exotic blocks in the Hamburg klippe, eastern Pennsylvania: U.S. Geological Survey Professional Paper 800-D, p. D29–D36, illus., **1972.** Early Ordovician North Atlantic province conodonts are contained in the limestone slide blocks in the Hamburg klippe. The nature of the fauna suggests that the limestones were

deposited in the "proto-Atlantic" ocean, transported by turbidity currents onto a slope, broken into blocks, and displaced northwestward by thrusting during Taconic tectonism.

4. Geologic map of the Stroudsburg quadrangle, Pennsylvania-New Jersey: U.S. Geological Survey Geologic Quadrangle Map GQ-1047, 3 p., 1 pl., scale 1:24,000, **1973.** The bedrock geology (Ordovician to Middle Devonian) is presented.
5. (and Berry, W. B. N.). Graptolites from the Martinsburg Formation, Lehigh Gap, eastern Pennsylvania: Journal of Research of the U.S. Geological Survey, v. 1, no. 1, p. 33–37, illus., **1973.** Graptolites indicate that the uppermost Martinsburg is as young as Edenian to early Maysvillian. The Martinsburg gradually overlies the Jacksonburg Limestone of late Middle Ordovician age, suggesting a lower age limit for the Martinsburg.
6. Map showing slate quarries and dumps in the Stroudsburg quadrangle [Monroe and Northampton Counties], Pennsylvania-New Jersey, with a discussion of their environmental significance: U.S. Geological Survey Miscellaneous Field Studies Map MF-578-A, scale 1:24,000, 2 sheets, **1974.** The slate is Ordovician in age and is found in the Martinsburg Formation. The strike and dip of bedding and cleavage determine how the quarries are developed and the dimensions of the slate produced. Some of the abandoned quarries have potential for public-water-supply reservoirs or for recreation purposes. Most, however, present several environmental hazards.
7. Metamorphic origin of slaty cleavage in eastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 7, p. 724, **1974.**
8. (and Sevon, W. D., and Glaeser, J. D.). Geology and mineral resources of the Lehighton and Palmerton quadrangles, Carbon and Northampton Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 195cd, 460 p., illus. including geologic maps, **1974.** The nature and occurrence of rocks and unconsolidated surficial deposits are described. This report treats the thickness, lithology, engineering characteristics, and groundwater and mineral-resource potential of each of the distinct materials mapped.
9. Map showing outcrop distribution of building stone in the Bossardsville, Pennsylvania, area, Saylorsburg 7½-minute quadrangle: U.S. Geological Survey Open-File Report 76-667, scale 1:24,000, **1976.**
10. Preliminary geologic map of parts of the Saylorsburg quadrangle [Monroe County], Pennsylvania: U.S. Geological Survey Open-File Report 78-170, scale 1:24,000, 2 sheets, **1978.**
11. (and Sevon, W. D.). Preliminary geologic map and sections of the Kunkletown quadrangle [Northampton, Carbon, and Monroe Counties], Pennsylvania: U.S. Geological Survey Open-File Report 78-392, scale 1:24,000, 3 sheets, **1978.**

See also Bergström, Stig M., 2; Connally, G. Gordan, 1; Harris, Anita G., 1.

ESPENSHADE, GILBERT H.

1. Geology of the northern part of the Blue Ridge anticlinorium, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 199–211, illus., **1970.** The stratigraphy and structural geology of the part of the Blue Ridge anticlinorium that extends from southern Pennsylvania to north of Roanoke, Virginia, is reviewed.

ESTEP-BARNES, PATRICIA A., *see* Finkelman, Robert B., 4.

EUGSTER, HANS P.

1. (and Chou, I-Ming). A model for the deposition of Cornwall-type magnetite deposits: Economic Geology, v. 74, no. 4, p. 763–774, illus., **1979.** The authors

suggest that HCl-bearing solutions are carriers of dissolved iron. Based on this suggestion, two detailed depositional models for Cornwall-type deposits are developed.

EVANS, ELIZABETH L.

1. Pleistocene beach sands of northwestern Pennsylvania: Bowling Green, Ohio, Bowling Green State University, M.S. thesis, **1970.**

See also Schooler, Elizabeth Evans.

EVENSON, EDWARD B.

1. (and Myers, P. B., and Sevon, W. D.). Vadose-zone gypsum cementation of Wisconsinan kame delta gravels in eastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 55, **1975.**

EVERLY, ROBERT A.

1. The geology of Huntingdon County, Pennsylvania: University Park, Pennsylvania State University, M.Ed. thesis, **1978.**

FAAS, RICHARD W., *see* Kaplan, Sanford S., 2.

FAHNESTOCK, ROBERT K., *see* Walton, John C., 1.

FAILL, RODGER T.

1. Kink band structures in the Valley and Ridge province, central Pennsylvania: Geological Society of America Bulletin, v. 80, no. 12, p. 2539–2550, illus., **1969.** The folds traditionally considered as concentric folds, of unchanging profile along their length, are shown (1) to possess planar limbs and narrow hinges; (2) to change greatly in profile along trend; and (3) to consist of intersecting kink bands, which explains the geometries of (1) and (2).
2. Tectonic development of the Triassic basin in Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 1, no. 7, p. 273–275, **1969.**
3. (and Wells, R. B.). A fault near Hazelton [sic] [Schuylkill County]: Pennsylvania Geology, v. 1, no. 5, p. 9–10, illus., **1970.** This thrust fault was well exposed by an Interstate Route 81 roadcut 5 miles south of Hazleton in the central anthracite region.
4. Kink band folding in central Pennsylvania—I, Kink bands: Pennsylvania Geology, v. 2, no. 5, p. 10–12, illus., **1971;** Kink band folding in central Pennsylvania—II: Pennsylvania Geology, v. 3, no. 1, p. 6–9, illus., **1972;** Kink band folding in central Pennsylvania—III: Pennsylvania Geology, v. 3, no. 6, p. 9–11, illus., **1972.** A series of articles on kink-band geometry. Examples of various profiles found in central Pennsylvania are illustrated.
5. Kink-band folding, Valley and Ridge province, Pennsylvania: Geological Society of America Bulletin, v. 84, no. 4, p. 1289–1313, illus., **1973.** Folds in the Valley and Ridge province are described as products of intersecting large kink bands, compatible with faults and other structures. Three-dimensional geometries of kink fold types are described, and examples from central Pennsylvania are discussed.
6. Tectonic development of the Triassic Newark-Gettysburg basin in Pennsylvania: Geological Society of America Bulletin, v. 84, no. 3, p. 725–740, illus., **1973.** The Triassic Newark-Gettysburg basin is interpreted as a simple downwarp, filled with sediment from all sides, rather than as a graben. Faulting occurred late in the history of the basin as part of its deformation.

7. (ed.). Structure and Silurian-Devonian stratigraphy of the Valley and Ridge province, central Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 38th, Camp Hill, Pa., Guidebook, 168 p., illus., **1973.** Summary and discussion of a field trip through the Valley and Ridge province of the Appalachians, a classic area of relatively simple to moderately complex geologic structures and nearly complete Paleozoic stratigraphic sections.
8. (and Nickelsen, R. P.). Structural geology, *in* Faill, R. T., ed., Structure and Silurian-Devonian stratigraphy of the Valley and Ridge province, central Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 38th, Camp Hill, Pa., Guidebook, p. 9–38, illus., **1973.** The Valley and Ridge province had been thought to contain fold structures of classic simplicity. This summary discussion demonstrates aspects of kink fold geometry, fault kinematics, and penetrative deformations.
9. Enclosing bedding as a reference datum [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 23, **1974.**
10. (and Hoskins, D. M., and Wells, R. B.). Middle Devonian stratigraphy in central Pennsylvania, a revision [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 23–24, **1974.**
11. (and Wells, R. B.). Geology and mineral resources of the Millerstown quadrangle, Perry, Juniata, and Snyder Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 136, 276 p., illus. including geologic maps, **1974.** This detailed report contains a description of the stratigraphy, geologic structure, and economic mineral resources of the quadrangle, and also has a chapter dealing with environmental geology.
12. High calcium limestone discovered in the Williamsport-Bloomsburg area: Pennsylvania Geology, v. 7, no. 6, p. 13–16, illus., **1976.** Extensive sampling in central Pennsylvania along the west and north branches of the Susquehanna River resulted in the discovery of a new source of high-calcium limestone in the Tonoloway and Keyser Formations.
13. Fossil distortion, Valley and Ridge province, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 262–263, **1977.**
14. (and Wells, R. B., and Sevon, W. D.). Geology and mineral resources of the Linden and Williamsport quadrangles, Lycoming County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 134ab, 66 p., illus. including geologic maps, **1977.** The bedrock units, surficial deposits, and groundwater resources of one of the fastest growing areas in central Pennsylvania are described in detail.
15. (and Wells, R. B., and Sevon, W. D.). Geology and mineral resources of the Salladasburg and Cogan Station quadrangles, Lycoming County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 133cd, 44 p., illus. including geologic maps, **1977.** Detailed descriptions are provided for the bedrock geology, surficial deposits, and groundwater resources.
16. Geology of Laurel Creek Reservoir and filtration plant, Lewistown water supply system [Mifflin County], *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 212–221, illus., **1978.** The stratigraphy and structure of the north limb of the Kishacoquillas, or Jacks Mountain, anticlinorium are outlined.
17. (and Hoskins, D. M., and Wells, R. B.). Middle Devonian stratigraphy in central Pennsylvania—a revision: Pennsylvania Geological Survey, 4th ser., General Geology Report 70, 28 p., illus., **1978.** Recent detailed mapping in central Pennsylvania led to the recognition of upward-coarsening sedimentary cycles in the rocks. As a result, a more coherent Middle Devonian stratigraphy was developed.

18. Deformation pattern in the Pennsylvania salient of the central Appalachians [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 11–12, **1979.**
19. Geology and mineral resources of the Montoursville South and Muncy quadrangles and part of the Hughesville quadrangle, Lycoming, Northumberland, and Montour Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 144ab, 114 p., illus. including geologic maps, **1979.** The bedrock units, unconsolidated surficial deposits, and groundwater resources are described in detail. Exposed rocks range in age from Late Ordovician to Late Devonian.
20. The Tipton block [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 12, **1979.**

See also Lapham, Davis M., 9; Wells, Richard B., 3.

FALKIE, THOMAS V.

1. (and Saperstein, L. W.). Land reclamation for the mining industry: Earth and Mineral Sciences, v. 40, no. 2, p. 9–12, illus., **1970.** Because of the needs of a mineral-oriented society, surface mining is necessary, but efforts to restore the land are also essential.

FALLA, W. S., *see* Williams, Eugene G., 10.

FAMEY, SYED M.

1. Relationship between the cross-strike lineaments and the distribution of oil and gas fields in northwestern Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1979.**

FANG, JEN-HO

1. Application of geostatistical method of kriging to the analysis of coal exploration data, *in* A special volume dedicated to Biq Chingchang on the occasion of his retirement: Geological Society of China Memoir 2, p. 245–248, illus., **1977.** Kriging, a random-process estimation technique, yielded improved estimates of values between drill-core samples using published data for the Pittsburgh coal in Greene County.

FARLEKAS, GEORGE M.

1. Floods at Easton, Pennsylvania-Phillipsburg, New Jersey: U.S. Geological Survey Hydrologic Investigations Atlas HA-246, scale 1:24,000, **1967.** Hydrologic data on the extent, depth, and frequency of flooding on the Lehigh and Delaware Rivers.

FAUTH, JOHN L.

1. Precambrian welded tuffs, Blue Ridge province, Maryland and Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 159–160, **1973.**
2. Geology and mineral resources of the Iron Springs area, Adams and Franklin Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 129c, 72 p., illus. including geologic map, **1978.** Contains detailed geologic mapping and a mineral-resource survey of an area where the underlying rocks include some of the oldest in Pennsylvania. The bedrock is mostly of Precambrian and Early Cambrian age.
3. Structural geology and mineral resources of the Blue Ridge Mountains in southcentral Pennsylvania: National Association of Geology Teachers, Eastern Section, Spring Meeting, Shippensburg, Pa., 1978, Guidebook, 77 p., **1978.** The regional geology and mineral resources of the South Mountain area, Adams and Franklin Counties, are discussed. Eight stops and 17 localities are described in some detail.

4. The significance of faulting in the Blue Ridge, southcentral Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 12, **1979.**

FAYETTE ENGINEERING COMPANY

1. Mine drainage abatement survey, Redstone Creek watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 141, 30 p., variously paginated appendices, illus., **1972.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

FEATHER, RALPH M., JR.

1. Geology of the New Enterprise 7½-minute quadrangle, Bedford County, Pennsylvania: Indiana, Pa., Indiana University of Pennsylvania, M.Ed. thesis, **1974.**

FEDEROFF, DOROTHY R.

1. Coal—Pennsylvania anthracite, *in* Metals, minerals, and fuels: U.S. Bureau of Mines Minerals Yearbook 1970, v. 1, p. 391–414, illus., **1972;** U.S. Bureau of Mines Minerals Yearbook 1971, v. 1, p. 377–404, illus., **1973;** U.S. Bureau of Mines Minerals Yearbook 1972, v. 1, p. 395–418, illus., **1974;** U.S. Bureau of Mines Minerals Yearbook 1973, v. 1, p. 377–402, illus., **1975;** U.S. Bureau of Mines Minerals Yearbook 1974, v. 1, p. 407–432, illus., **1976;** U.S. Bureau of Mines Minerals Yearbook 1975, v. 1, p. 457–484, illus., **1977.** Detailed accounts of anthracite production and distribution annually from 1970 to 1975. Total production fell steadily from about 9.7 million short tons in 1970 to about 6.2 million short tons in 1975.

FEDOSH, MICHAEL S., *see* Busch, Richard M., 1.

FEELEY, MARY H.

1. (and Wright, T. O.). Geochemistry of the (Ordivician [sic]) Jonestown Red Beds [abs.]: Pennsylvania Academy of Science Proceedings, v. 52, no. 1, p. 105, **1978.**

See also Wright, Thomas O., 6.

FELDMAN, ARLEN D.

1. Downstream effects of the levee overtopping at Wilkes-Barre, PA, during tropical storm Agnes [abs.]: EOS (American Geophysical Union Transactions), v. 54, no. 4, p. 274, **1973.**

FELDMAN, HOWARD R., *see* Blackbeer, Lawrence E., 1.

FELLOWS, JOHN

1. Inventory and documentation of significant geologic sites in Crawford County: Meadville, Pa., Allegheny College, Bachelor's thesis, **1975.**

FERGUSON, HARRY F., *see* Gray, R. E., 5; Hamel, James V., 3.

FERGUSON, R. B.

1. (and Jones, P. L.). Scranton 1° x 2° NTMS area, New Jersey, New York, and Pennsylvania—Preliminary basin data report—Hydrogeochemical and stream sediment reconnaissance: U.S. Department of Energy Report GJBX-2-79, variously paginated, illus., **1978** [not seen].

See also Price, Van, 1.

FERGUSSON, WILLIAM B.

1. French Creek State Park [Berks and Chester Counties]—Story of the rocks: Pennsylvania Geological Survey, 4th ser., Park Guide 6, pamphlet **[1971].** The state park, situated in southeastern Pennsylvania, contains rocks from each of the major rock groups: igneous, sedimentary, and metamorphic. Representative sites are listed and explained.
2. Sinkholes, *in* Amenta, R. V., and others, Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, p. 28–32, illus., **1974.** A generalized discussion of sinkholes in the Chester Valley of southeastern Pennsylvania.

See also Amenta, Roddy V., 4.

FERM, JOHN C.

1. Allegheny deltaic deposits, *in* Morgan, J. P., and Shaver, R. H., eds., Deltaic sedimentation—Modern and ancient: Society of Economic Paleontologists and Mineralogists Special Publication 15, p. 246–255, illus., **1970;** reprinted *in* Van Houten, F. B., ed., Ancient continental deposits: Stroudsburg, Pa., Dowden, Hutchinson and Ross, p. 260–268, **1977;** reprinted *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 137–146, illus., **1979.** A summary of delta studies which form the basis for a lithogenetic model applicable to Middle Pennsylvanian rocks of the northern Appalachian Plateau.
2. Carboniferous environmental models in eastern United States and their significance, *in* Briggs, Garrett, ed., Carboniferous of the southeastern United States: Geological Society of America Special Paper 148, p. 79–95, illus., **1974.** Environmental models were used to explain some stratigraphic characteristics of Carboniferous rocks established by earlier workers.
3. Pennsylvanian cyclothems of the Appalachian Plateau, a retrospective view: U.S. Geological Survey Professional Paper 853, Part II, p. 57–64, illus., **1975;** reprinted *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 284–290, illus., **1979.** After reviewing the original theory of cyclothems and the history of its application to the coal-bearing rocks of the Appalachian Plateau, the author suggests abandonment of the concept and proposes in its place the use of environmental lithic models which can be compared to products of known recent depositional processes.
4. Allegheny deltaic deposits: a model for the coal-bearing strata, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 291–294, illus., **1979.** General characteristics of the Allegheny Group are discussed. In the lower part, it consists of thick dark shales and thin coals overlying orthoquartzitic sandstones; the lithology changes upward to dominantly sandstones and thicker coals. Laterally the proportion of sandstone diminishes, and the presence of marine fossils increases northwestward.
5. Petrology of some Pennsylvanian sedimentary rocks [Jefferson County], *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 50–67, illus., **1979** [reprinted from Journal of Sedimentary Petrology, v. 32, no. 1, p. 104–123, 1962].
6. (and Horne, J. C., Weisenfluh, G. A., and Staub, J. R., eds.). Collected papers, *in* Carboniferous depositional environments in the Appalachian region: Colum-

bia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 1–619, illus., **1979.** A collection of reprinted articles (1959–1979) dealing with the coal measures in the Appalachian region. The area covered extends from the anthracite coal fields of Pennsylvania to the Warrior coal field in Alabama. Individual articles are annotated separately.

7. (and Staub, J. R., Baganz, B. P., Clark, W. J., Galloway, M. C. C. B., Hohos, E. F., Jones, T. L., Jr., Mathew, D., Pedlow, G. W., III, and Robinson, M. J.). The shape of coal bodies, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 605–619, illus., **1979.** The characteristics and interpreted depositional environments of a widely mined Allegheny coal bed observed at two different locations in western Pennsylvania are discussed. One area studied by Pedlow appears to be on the seaward margin of the deltaic plain, whereas the other is interpreted as having a transitional lower delta plain setting.
8. (and Williams, E. G.). Characteristics of a Carboniferous marine invasion in western Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 23–34, illus., **1979** [reprinted from Journal of Sedimentary Petrology, v. 35, no. 2, p. 319–330, 1965].
9. (and Williams, E. G., Cavaroc, V. V., Jr., Flores, R. M., Henderson, B. K., Webb, J. E., and Zimmerman, R. K.). Allegheny correlations, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 13–17, illus., **1979.** A regional correlation was made of key beds in the Allegheny Group of the Dunkard basin. In Pennsylvania this consisted of a broad line of section connecting New Castle to Punxsutawney to Somerset. Even though correlation of individual beds was acknowledged to be of low reliability, some important general characteristics of the stratigraphy emerged from the study.

See also Caruccio, Frank T., 4; Horne, John C., 1; Williams, Eugene G., 11.

FIELDS, H. H.

1. (and Cervik, Joseph, and Goodman, T. W.). Degasification and production of natural gas from an air shaft in the Pittsburgh coalbed: U.S. Bureau of Mines Report of Investigations 8173, 23 p., illus., **1976.** Horizontal holes were drilled in the Pittsburgh coalbed to prove that methane can be effectively removed in commercial quantities.

FIGUERS, SANDY

1. The upper Bushkill Creek, structurally controlled or subsequent erosion?: Easton, Pa., Lafayette College, Senior thesis, **1971.**

FILER, J.

1. A study and comparison of fluid inclusions from blue and white quartz from a banded gneiss in the Downingtown quadrangle, southeastern Pennsylvania [Chester County]: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1977.**

FINKELMAN, ROBERT B.

1. (and Lapham, D. M., Barnes, J. H., and Downey, W. F., Jr.). Observations on minerals from burning anthracite seams and culm in Pennsylvania [abs.]:

Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 27–28, **1974.**

2. (and Klemic, Harry). Brannerite from the Penn Haven Junction uranium occurrence, Carbon County, Pennsylvania: Journal of Research of the U.S. Geological Survey, v. 4, no. 6, p. 715–716, **1976.** Thorium-free brannerite was identified in the Upper Devonian uraniferous sandstone, but, because of metamorphism, some uranium may be in less soluble minerals than in deposits in the western part of the United States, and, therefore, in-place leaching of the uranium may be impractical.
3. (and Mrose, M. E.). Downeyite, the first verified natural occurrence of SeO_2: American Mineralogist, v. 62, no. 3–4, p. 316–320, illus., **1977.** Downeyite, naturally occurring SeO_2, forms as acicular crystals from gases escaping through vents on culm banks in the anthracite region. It was first collected in 1972 and is named for its collector, Wayne F. Downey, Jr.
4. (and Estep-Barnes, P. A.). Nickeloan pyroaurite verified from the Cedar Hill quarry, Lancaster County, Pennsylvania: Pennsylvania Geology, v. 9, no. 3, p. 9–11, illus., **1978.** Pale-green encrustations on serpentinites from the quarry are mostly nickel-bearing pyroaurite, identical to some samples found in Scotland.
5. (and Dulong, F. T., Stanton, R. W., and Cecil, C. B.). Minerals in Pennsylvania coal: Pennsylvania Geology, v. 10, no. 5, p. 2–5, illus., **1979.** Recent studies indicate that coal may contain substantial amounts of minerals, such as kaolinite, illite, pyrite, and quartz, and abundant suites of accessory minerals, such as apatite, chalcopyrite, and sphalerite.
6. (and Stanton, R. W.). Distribution of sphalerite, chalcopyrite, and lead selenide (clausthalite?) in Appalachian coals [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 64, **1979.**
7. (and Stanton, R. W., Cecil, C. B., and Minkin, J. A.). Modes of occurrence of selected trace elements in several Appalachian coals: American Chemical Society, Division of Fuel Chemistry, preprints of papers presented at Honolulu, Hawaii, v. 24, p. 236–241, **1979** [not seen].

See also Minkin, Jean A., 1.

FISH, THOMAS W.

1. Geology of the Catoctin Mountain-South Mountain anticlinorium: Millersville, Pa., Millersville State College, M.Ed. thesis, **1974.**

FISHEL, KEN W.

1. The applications of electric logs in Appalachia's coal exploration [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 866–867, **1976.**

FISHER, D. W., *see* Hobba, W. A., Jr., 1.

FISHER, GEORGE W.

1. The geologic evolution of the northeastern Piedmont of the Appalachians [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 172–173, **1976.**
2. (and Higgins, M. W., and Zietz, Isidore). Geological interpretations of aeromagnetic maps of the crystalline rocks in the Appalachians, northern Virginia to New Jersey: Maryland Geological Survey Report of Investigations 32, 43 p., illus. including geologic and magnetic survey maps, **1979** [not seen].

See also Higgins, Michael W., 3.

FISHER, R. STEPHEN

1. Strontium isotopes in surface waters of a portion of the Susquehanna River drainage basin, Pennsylvania and Maryland: Oxford, Ohio, Miami University, M.S. thesis, **1975.**
2. (and Stueber, A. M.). Strontium isotopes in surface waters of the Susquehanna River basin, Pennsylvania and Maryland [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 6, p. 756, **1975.**
3. (and Stueber, A. M.). Strontium isotopes in selected streams within the Susquehanna River basin: Water Resources Research, v. 12, no. 5, p. 1061–1068, illus., **1976.** The distribution of strontium isotopes in surface waters of a portion of the Susquehanna River basin demonstrated the potential of using the $^{87}Sr/^{88}Sr$ ratio as a hydrologic tracer.

FISHER, WILSON, JR.

1. Airborne infrared detection and mapping of coal mine drainage: Symposium on Coal Mine Drainage Research, 4th, Pittsburgh, Pa., 1972, Papers, p. 331–339, illus., **1972.** A small stream in the Houtzdale quadrangle, Centre County, which receives water from deep and strip mines, was the site of the investigation using airborne infrared techniques. By optimizing various parameters, water sources and their drainageways were mapped. This technique does not replace the standard field and laboratory methods, but it does reduce the size of the area to be studied.

FLANIGAN, KENNETH R.

1. A sequence of field trips dealing with sedimentary deposition in Clinton County from the Late Ordovician Period to the end of the Pennsylvanian Period: University Park, Pennsylvania State University, M.Ed. thesis, **1978.**

FLEMING, ROBERT S., JR.

1. A geophysical study of the southwestern end of the Scranton gravity high: Bethlehem, Pa., Lehigh University, M.S. thesis, **1975.**
2. (and Sumner, J. R.). Interpretation of geophysical anomalies over the arcuate Appalachians [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 58, **1975.**

See also Sumner, John R., 4.

FLETCHER, FRANK W.

1. (and Woodrow, D. L.). Geology and economic resources of the Pennsylvania portion of the Milford and Port Jervis 15-minute quadrangles [Pike County]: Pennsylvania Geological Survey, 4th ser., Atlas 223, 64 p., illus. including geologic map, **1970.** The stratigraphy of the bedrock units, which range in age from early Middle Devonian to middle Late Devonian, the structure, and the mineral resources of the area are presented.

See also Woodrow, Donald L., 1.

FLINT, NORMAN K.

1. (and Hamel, J. V.). Application of geology in highway planning and design [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 19, **1970.**
2. (and Hamel, J. V.). Engineering geology at two sites on Interstate 279 and Interstate 79 northwest of Pittsburgh, Pennsylvania: Geological Society of America, Annual Meeting, Field Trip Guidebook, v. 1971, no. 6, p. 36–45, illus., **1971;** *in* Rollins, H. B., field trip coordinator, National Association of Geology Teachers,

Eastern Section, Annual Spring field trips: National Association of Geology Teachers, Eastern Section, Pittsburgh, Pa., University of Pittsburgh, Guidebook, p. 2-1— 2-10, illus., **1973.** Causes of and rehabilitation of landsliding are reviewed.

3. Redbeds and their relation to landsliding in the Pittsburgh area, *in* Donahue, J., and Rollins, H. B., Conemaugh (Glenshaw) marine events: American Association of Petroleum Geologists, Eastern Section, Annual Meeting, 3rd, and Society of Economic Paleontologists and Mineralogists, Eastern Section, Spring Field Trip, Pittsburgh, Pa., Guidebook, p. C1-C7, **1974.** The upper part of the Conemaugh Group contains many weak claystones ("red beds") in the Pittsburgh area (Allegheny County). This interval, about 350 feet thick, is one in which numerous landslides have occurred. The geology of the red beds, particularly the prominent Pittsburgh red-bed unit, is discussed in relation to other factors involved in landsliding.
4. Landsliding in Conemaugh Group rocks (Upper Carboniferous) in the Pittsburgh, Pennsylvania area, *in* Donahue, Jack, and Rollins, H. B., eds., Geology of the northern Appalachian coal field: International Congress of Carboniferous Stratigraphy and Geology, 9th, Field Trip 2, Guidebook, University of Pittsburgh and Pittsburgh Geological Society, p. D1-D4, illus., **1979.** The geology of two landslide sites in Allegheny County, one on already constructed Interstate Route 79, and the other on the proposed site of Interstate Route 279, is discussed.
5. Stratigraphic subdivision of the Pennsylvanian Conemaugh Group [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 13, **1979.**

See also Pimentel, Nelly R., 2.

FLIPPO, HERBERT N., JR.

1. Chemical and biological conditions in Bald Eagle Creek and prognosis of trophic characteristics of Foster Joseph Sayers Reservoir, Centre County, Pennsylvania: U.S. Geological Survey Open-File Report, 48 p., illus., **1970.** Hydrologic data relevant to the newly completed reservoir are presented and evaluated.
2. (and Lenfest, L. W., Jr.). Flood of June 1972 in Wilkes-Barre area [Luzerne County], Pennsylvania: U.S. Geological Survey Hydrologic Investigations Atlas HA-523, scale 1:24,000, **1973.** Hydrologic data are provided on the frequency, depth, and extent of flooding along a 19-mile reach of the Susquehanna River in the Wyoming Valley.
3. Springs of Pennsylvania: Pennsylvania Department of Environmental Resources, Office of Resources Management, Water Resources Bulletin 10, 46 p., illus., **1974.** Discharge and water-quality data are presented for 196 springs. A location map is included.
4. Flood of June 22-23, 1972, at Lock Haven [Clinton County], Pennsylvania: U.S. Geological Survey Hydrologic Investigations Atlas HA-541, scale 1:12,000, **1975.** The area inundated by the flood is shown on a topographic base. Flood frequency relations are given for both natural flows and regulated flows, and profiles are shown for the 1936 and 1972 floods.
5. Temperatures of streams and selected reservoirs in Pennsylvania: Pennsylvania Department of Environmental Resources, Office of Resources Management, Water Resources Bulletin 11, 95 p., illus., **1975.** Water-temperature data collected at 72 stream sites from 1944 to 1970 are summarized and tabulated.
6. Floods in Pennsylvania: a manual for estimation of their magnitude and frequency: U.S. Geological Survey Open-File Report 76-391, 113 p., 5 pls., illus., **1976.**
7. Floods in Pennsylvania: Pennsylvania Department of Environmental Resources, Office of Resources Management, Water Resources Bulletin 13, 59 p., illus., **1977.**

Methods for estimating flood discharges at ungaged sites on unregulated streams are presented.

See also Wood, Charles R., 1.

FLORES, R. M., *see* Ferm, John C., 9.

FLORY, RICHARD

1. Paleoenvironments of a Devonian reef complex in northeastern Pennsylvania: Philadelphia, Temple University, M.S. thesis, **1970.**

FLOWER, MARY D.

1. Effects of urbanization on stream development [Letort Spring Run, Carlisle, Cumberland County] [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 160–161, **1973.**

FLOWER, ROUSSEAU H.

1. (and Gordon, Mackenzie, Jr.). New Nephriticeratidae (Nautiloidea) from the Devonian of Maryland, Pennsylvania, and Indiana, *in* Geological Survey Research 1972, Chapter D: U.S. Geological Survey Professional Paper 800-D, p. D45–D50, illus., **1972.** Three species are described. Two are new and from the Middle and Upper Devonian rocks in the vicinity of the Maryland-Pennsylvania border: *Rhadinoceras atlas* n. sp. and *Nephriticerina cornucopia* n. sp.

FOLAND, K. A.

1. A model for "excess" radiogenic argon in biotite [abs.]: EOS (American Geophysical Union Transactions), v. 59, no. 4, p. 408, **1978.**
2. (and Muessig, K. W.). A Paleozoic age for some charnockitic-anorthositic rocks: Geology, v. 6, no. 3, p. 143–146, illus., **1978.** Samples indicated that primary crystallization and metamorphism occurred in early Paleozoic time in the Arden pluton of the Wilmington Complex in southeastern Pennsylvania and northern Delaware.

FONDA, SHIRLEY S., *see* Cuffey, Roger J., 2.

FOORD, E. E., *see* Heyl, Allen V., 2.

FOOSE, RICHARD M.

1. From town dump to sanitary landfill; a case history: [abs.], Association of Engineering Geologists, Annual Meeting, 14th, Program Abstracts, p. 24–25, **1971;** [abs.], Geological Society of America Abstracts with Programs, v. 3, no. 1, p. 29, **1971;** Association of Engineering Geologists Bulletin, v. 9, no. 1, p. 1–16, illus., **1972** [not seen].
2. (and Hess, P. W.). Scientific and engineering parameters in planning and development of a landfill site in Pennsylvania, *in* Coates, D. R., ed., Geomorphology and engineering: Stroudsburg, Pa., Dowden, Hutchinson and Ross, Inc., p. 289–312, illus., **1976.** A discussion of the critical geologic and geomorphic parameters to be considered in the siting and development of a sanitary landfill. The conversion of a "town dump" in Derry Township, Dauphin County, to a trench-type sanitary landfill serves as the example.
3. (and Humphreville, J. A.). Engineering geological approaches to foundations in the karst terrain of the Hershey Valley: Association of Engineering Geologists Bulletin, v. 16, no. 3, p. 355–381, illus., **1979.** A summary of geologic conditions, a discussion of geological engineering investigations, and an evaluation of conditions for several structures recently erected.

FORD, CHARLES T.

1. Selection of limestones as neutralizing agents for coal mine water: Symposium on Coal Mine Drainage Research, 3rd, Pittsburgh, Pa., 1970, Papers, p. 27–51, illus., **1970.** The most effective limestones are those approaching pure $CaCO_3$; those having lower CaO but containing calcite and having a high surface area are equally effective.
2. Development of a limestone treatment process for acid mine drainage: Symposium on Coal Mine Drainage Research, 4th, Pittsburgh, Pa., 1972, Papers, p. 266–291, illus., **1972.** Laboratory experimentation on the treatment of coal mine drainage with limestone is discussed, as are the requirements for application of this process in a projected full-scale operation.
3. Selection of limestones as neutralizing agents for coal-mine water: Ohio Division of Geologic Survey Miscellaneous Report 1, p. 30–42, illus., **1974.** Fourteen limestones are evaluated for use in the neutralization of acid mine drainage. Included are five from Pennsylvania.

FOSS, JOHN E.

1. The pedological record at several paleoindian sites in the Northeast, *in* Newman, W. S., and Salwen, Bert, eds., Amerinds and their paleoenvironments in northeastern North America: New York Academy of Sciences Annals, v. 288, p. 234–244, illus., **1977.** The soil characteristics of the Flint Run Complex in northern Virginia and the Shawnee-Minisink site in eastern Pennsylvania are discussed. The morphological, physical, and chemical characteristics of the soils were compared and the data integrated with archeological, geological, and palynological information to aid in interpreting weathering patterns, archeological history, and age relationships at the two sites.

FOX, WADE G.

1. Use of a generalized slope map in regional planning: Pennsylvania Geology, v. 4, no. 2, p. 4–11, illus., **1973.** Because of the rugged terrain of southwestern Pennsylvania, slope maps were developed to aid planners. The procedures followed in making the maps, as well as their uses, are discussed.

FRANCE, VALERIE

1. Winter erosion of selected banks of Woodcock Creek, Crawford County, Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1974.**

FRANKLIN, WESLEY D.

1. Field trip no. 1—Part one, Raystown Dam, *in* Engineering geology of the Raystown Dam and the historical engineering geology of the Chesapeake and Ohio Canal—Field trip numbers 1 and 5: Association of Engineering Geologists, Annual Meeting, 1970, Guidebook, p. 2–5, illus., **1970.** The geology of the dam site and the various construction and design features of the project are discussed.

FRANTZ, ROBERT L.

1. (and Keeney, J. F., and Stefanko, Robert). Feasibility studies and demonstration of methane recovery from Pennsylvania coal seams: U.S. Bureau of Mines Open-File Report 4–79, 187 p., illus., **1978** [not seen].

FREEDMAN, JACOB L.

1. (and Kauffman, M. E.). Interfingering and transgressive clastic and carbonate facies along the continental margin of Maryland, Pennsylvania and New York during Cambro-Ordovician time [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 1, p. 31, **1971.**

2. Geochemical prospecting for zinc, lead, copper, and silver, Lancaster Valley, southeastern Pennsylvania: U.S. Geological Survey Bulletin 1314-C, p. C1-C49, illus. including geologic maps, **1972.** The purpose of the project was to search for geochemical anomalies of lead, zinc, copper, and silver to determine whether they indicate a greater extent of potentially mineralized ground than is indicated by other geological features.
3. Environmental zinc contamination and plant toxicity: Interface, v. 6, no. 3, p. 26-27, illus., **1977.** Relates levels of zinc and iron in soil to plant toxicity, useful in geochemical exploration. The study was done at the abandoned Bamford zinc mine, Lancaster County.

FREEDMAN, JANE L.

1. (ed.). "Lots" of danger—Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, 85 p., illus., **1977.** Various types of geologic conditions and hazards that affect construction in southwestern Pennsylvania are identified and described. Topics include landslides, subsidence over mined-out areas, and floodplains. Individual articles are annotated separately.

FRENCH, ANDREW N.

1. Paleomagnetism and rock magnetism of the Rose Hill Formation: Ann Arbor, University of Michigan, M.S. thesis, **1978.**

See also Van der Voo, Rob, 3.

FRENCH, ROWLAND B.

1. Lower Paleozoic paleomagnetism of the North American Craton: Ann Arbor, University of Michigan, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 37, no. 6, p. 2726B, **1976.**

See also Van der Voo, Rob, 1, 3; Watts, Doyle R., 1.

FREY, EDWARD P., *see* Kauffman, Marvin E., 2.

FREY, MAURICE G.

1. Influence of Salina Salt on structure in New York-Pennsylvania portion of Appalachian Plateau [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 10, p. 2108, **1972.**
2. Influence of Salina Salt on structure in New York-Pennsylvania part of Appalachian Plateau: American Association of Petroleum Geologists Bulletin, v. 57, no. 6, p. 1027-1037, illus., **1973.** From information presented, it appears that the entire Appalachian Plateau fold belt may be underlain by a décollement zone. This zone is probably in the Salina Salt throughout most of its extent, although deeper décollements may be present in older shales, particularly in the region adjacent to the Valley and Ridge province.

FRIBERG, JAMES F.

1. Mineralogy and provenance of the Recent alluvial sands of the Ohio River drainage basin: Bloomington, Ind., Indiana University, Ph.D. thesis, **1970.**

FRIEDEL, R. A., *see* Kessler, Theodore, 1, 2.

FRIEDMAN, G. M., *see* Humphreys, Matthew, 1, 3, 4.

FRISCHMANN, PETER S.

1. (and Wade, W. M.). Middle Ordovician carbonate environments of central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 266, **1977.**

2. Carbonate environments of Middle Ordovician interval, central Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 62, no. 3, p. 514–515, **1978.**

FRITZ-MILLER, MOLLY

1. Paleoenvironmental analysis of the Tonoloway and lower Keyser Formation (Upper Silurian, West Virginia, Md., Pa., Virginia): Washington, D. C., George Washington University, M.S. thesis, **1971.**

FROHNE, K.-H.

1. (and Schrider, L. A., and Romeo, M. K.). Gasflood performance prediction for the Cooper sand of the Fork Run pool, Warren and McKean Counties, Pa.: U.S. Bureau of Mines Report of Investigations 7272, 49 p., illus., **1969.** The Upper Devonian Cooper sand is the primary producing horizon in the Fork Run pool, Warren and McKean Counties. Primary recovery is estimated at approximately 20 percent in a well life of 90 years. Computer predictions for gasflooding of the entire pool are economically favorable for improving oil recovery and for reducing well life.
2. Gasflood improves Appalachian recovery: Petroleum Engineering, v. 42, no. 7, p. 79, 82, 84, **1970** [not seen].
3. Increasing oil production from the Venango Second sand—A reappraisal of two in situ combustion tests: U.S. Bureau of Mines Report of Investigations 7536, 15 p., illus., **1971.** The study concerns the increased oil production from the Venango Second sand near Reno (Venango County) following combustion pilot tests of the area that were considered failures. Supported by the large volume of air left after the second test, combustion apparently occurred in the Venango Second sand, generating enough carbon dioxide to help repressure the formation.

FRY, HAROLD, JR., *see* Brice, William R., 1.

FULTON, L. J. P.

1. Stratigraphy and sedimentology of radioactive Devonian-Mississippian shales of the central Appalachian basin: Cincinnati, Ohio, University of Cincinnati, Ph.D. thesis, **1977;** [abs.], Dissertation Abstracts International, v. 38, no. 7, p. 3093B, **1978.**

GAIT, GEORGE B.

1. Microfilming maps of abandoned anthracite mines—Mines in the Lackawanna basin, Northern Anthracite field: U.S. Bureau of Mines Information Circular 8453, 11 p., illus., **1970.** As part of a continuing program of data collection, a catalog of microfilmed maps of the area is presented.
2. Microfilming maps of abandoned anthracite mines—Mines in the Western Middle Anthracite field: U.S. Bureau of Mines Information Circular 8519, 11 p., illus., **1971.** See annotation in entry 1 above.
3. Microfilming maps of abandoned anthracite mines—Mines in the Southern Anthracite field: U.S. Bureau of Mines Information Circular 8779, 11 p., illus., **1978.** See annotation in entry 1 above.

GAITHER, BRUCE E.

1. The relation of spring discharge behavior to the hydrologic properties of carbonate aquifers: University Park, Pennsylvania State University, M.S. thesis, **1978.**

GALE, WILLIAM F.

1. (and Jacobsen, T. V., and Smith, K. M.). Iron, and its role in a river polluted by mine effluents: Pennsylvania Academy of Science Proceedings, v. 50, no. 2, p. 182–195, illus., **1976.** The transport and deposition of iron in the Susquehanna River over a two-year period from Falls, Wyoming County, to Columbia, Lancaster County, was studied. The effects of temperature, flow conditions, and aquatic biota on the iron, and the effects of the iron on the ecosystem, are discussed.

GALLAHER, JOHN T.

1. Summary ground-water resources of Allegheny County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 35, 71 p., illus. including geologic map, **1973.** The geologic units include the Permian-Pennsylvanian Washington Formation, the Pennsylvanian Monongahela, Conemaugh, and Allegheny Groups, and unconsolidated Quaternary deposits. These formations are generally persistent and water bearing throughout the county. The discharges from oil and gas wells and from abandoned strip and deep mines are the major sources of pollution.

See also Schiner, George R., 3, 4.

GALLOWAY, K.

1. Groundwater in the Lansdale-Vernfield area of Montgomery County, Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1978.**

GALLOWAY, M. C. C. B., *see* Ferm, John C., 7.

GALTON, PETER M., *see* Olsen, Paul E., 1.

GANDER, CRAIG R.

1. Sources of stormflow from a forested watershed and a carbonate spring in central Pennsylvania determined by natural deuterium variations: University Park, Pennsylvania State University, M.S. thesis, **1979.**

GANG, M. W.

1. Controls on heavy metals in surface and ground waters affected by coal mine drainage—Clarion River-Redbank Creek watershed, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1974.**
2. (and Langmuir, Donald). Control on heavy metals in surface and ground waters affected by coal mine drainage—Clarion River-Redbank Creek watershed, Pennsylvania: Symposium on Coal Mine Drainage Research, 5th, Papers, p. 39–69, illus., **1974** [not seen].

GANIS, GEORGE R.

1. Geology of the Ordovician clastic rocks of the Bethel quadrangle, Pennsylvania: Bethlehem, Pa., Lehigh University, M.S. thesis, **1972.**
2. Availability of E-aggregates in southeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 13–14, **1979.**

GANIS, ROBERT, *see* Raring, Andrew M., 1.

GANNETT FLEMING CORDDRY AND CARPENTER, INC.

1. Mine drainage pollution abatement measures for the Beech Creek watershed, Centre and Clinton Counties, Pennsylvania: Pennsylvania Department of Mines and Mineral Industries, Operation Scarlift Project SL 111, variously paginated,

illus., **1970.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

2. Mine drainage abatement measures for the Shamokin Creek watershed, Columbia and Northumberland Counties, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 113, 70 p., variously paginated tables, illus., **1972.** See annotation in entry 1 above.
3. Mine drainage abatement measures for the Tioga River watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 136–1, 32 p., illus., **1972.** See annotation in entry 1 above.
4. Swatara Creek mine drainage abatement project, Part I, Schuylkill County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 126–1, 57 p., variously paginated tables, illus., **1972.** See annotation in entry 1 above.
5. Mine drainage abatement measures for the Jeansville basin, Carbon, Luzerne, and Schuylkill Counties, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 135, 65 p., illus., **1974.** See annotation in entry 1 above.

GARDNER, GEORGE D.

1. (and Salver, H. A.). Foundation performances of single family houses, *in* Freedman, J. L., ed., "Lots" of danger—Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, p. 17–28, illus., **1977.** Foundation settlement, foundation heave, and subsurface wall failures are discussed.

GARDNER, JOSEPH V.

1. A quantitative geomorphic study in the Lehigh River-Delaware River section of the Great Valley of Pennsylvania: Indiana, Pa., Indiana University of Pennsylvania, M.A. thesis, **1971.**
2. A quantitative geomorphic study in the Lehigh River-Delaware River section of the Great Valley of Pennsylvania: Illinois Geographical Society Bulletin, v. 14, no. 2, p. 3–16, illus., **1972** [not seen].

GARIHAN, A. L.

1. The influence of geologic and geomorphic parameters in the flood response of small drainage basins in Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1970.**

See also Lutz-Garihan, Anne B.

GARIHAN, JOHN M., *see* Cuffey, Roger J., 1, 2.

GARLOCK, THOMAS L.

1. (and Isaacson, P. E.). An occurrence of a *Cruziana* community in the Moyer Ridge Member of the Bloomsburg Formation (Late Silurian)—Snyder County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 178–179, **1976.**
2. (and Isaacson, P. E.). An occurrence of a *Cruziana* population in the Moyer Ridge Member of the Bloomsburg Formation (Late Silurian)—Snyder County, Pennsylvania: Journal of Paleontology, v. 51, no. 2, p. 282–287, illus., **1977.** Two outcrops of the Moyer Ridge Member of the Bloomsburg Formation yielded the trilobite trace fossils *Cruziana* and *Rusophycus.*

3. (and Isaacson, P. E.). Trace fossil ichnocoenoses from the Rose Hill Formation (Early Silurian), north-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 267, **1977.**

GARTON, RAY

1. (ed.). Cave descriptions—Pennsylvania, *in* Garton, Ray, ed., 1976 Annual Convention guidebook: National Speleological Society Annual Convention, Morgantown, W. Va., Guidebook, p. 24–44, illus., **1976.** Descriptions and maps of 10 caves in Fayette and Westmoreland Counties.

GARWOOD, SUSAN M., *see* Wright, Thomas O., 3.

GATES, T. M., *see* Werner, Matthew L., 1.

GBUREK, WILLIAM J.

1. (and Heald, W. R.). Soluble phosphate output of an agricultural watershed in Pennsylvania: Water Resources Research, v. 10, no. 1, p. 113–118, illus., **1974.** The soluble phosphate output of an agricultural watershed in Pennsylvania is evaluated, and some implications of the findings regarding the services and fate of soluble phosphate in the stream are discussed. The study area is the Mahantango watershed, which drains into the Susquehanna River.
2. The Mahantango Creek watershed—general hydrology and research results, *in* Correll, D. L., ed., Watershed research in eastern North America—A workshop to compare results: Smithsonian Institution, Chesapeake Bay Center for Environmental Studies, Edgewater, Md., v. 1, p. 227–250, illus., **1977.** Rainfall-runoff data were intensively collected across the watershed area from 1967 to 1972, and more limited research efforts continued until 1976.

See also Engman, Edwin T., 1, 2.

GEIGER, E. G., JR., *see* Reidenouer, David R., 1.

GEISER, PETER

1. Present knowledge of strain distribution in the Appalachian orogen [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 431, **1979.**

GENERAL ANALYTICS, INC.

1. Mine drainage abatement survey, Piersons Run watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 157, 20 p., unpaginated appendix, illus., **1971.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

GEORGE, RICHARD L.

1. Man and chert in western Pennsylvania: Rocks and Minerals, v. 53, no. 3, p. 104–107, illus., **1978.** Archeological periods of western Pennsylvania are dated and discussed; chert sources and the utilization of chert by early man are the central theme.

GEO-TECHNICAL SERVICES

1. Study of acid mine drainage outflows from the northwest dump into the Lackawanna River, Fell Township, Lackawanna County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 139-3, 36 p., variously paginated appendices, illus., **1974.** This open-file report includes

an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

2. Study of acid mine drainage abatement, Nanticoke, Warrior and Solomon Creeks, Hanover and Wilkes-Barre Townships, Luzerne County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 181-3, 90 p., variously paginated appendices, illus., **1975.** See annotation in entry 1 above.
3. Mine drainage pollution abatement study—Mill Creek watershed, Plains, Jenkins & Wilkes-Barre Twps., Luzerne Co., Pa.: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 181-4, 113 p., variously paginated appendices, illus., **1976.** See annotation in entry 1 above.

GEOTIMES

1. Planning a new town's environment: Geotimes, v. 16, no. 6, p. 17-21, illus., **1971.** Fifty-five geologists, architects, engineers, and planners were hired to explore the problems involved in this assignment: given a topographic map of the Mifflinville quadrangle (Columbia County), develop a comprehensive plan for a new town that is to reach a population of 300,000 in 10 years.

GERHART, JAMES M.

1. A study of the metabasalts in southern York County: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**
2. Digital simulation of the aquifer potential of a portion of the Elliot[t] Park-Burgoon aquifer in eastern Clearfield and western Centre Counties, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1977.**
3. (and Parizek, R. R.). Digital simulation of the yield potential of the Elliot[t] Park-Burgoon aquifer in eastern Clearfield and western Centre Counties, Pennsylvania: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report 113, 142 p., illus., **1977** [not seen].

GERSTLE, K. H., *see* Cook, N. E., Jr., 1.

GETZOFF, R., *see* El-Ashry, M. T., 4.

GEYER, ALAN R.

1. (and Lapham, D. M.). Quartz crystals found in the Lehigh Gorge: Pennsylvania Geology, v. 1, no. 3, p. 11-13, illus., **1969.** A quartz-collecting locality in Lehigh County is identified.
2. Fossils galore: Pennsylvania Geology, v. 1, no. 4, p. 12, illus., **1970.** Brush Valley, Centre County, is one of the best fossil-collecting areas in central Pennsylvania. A map of the locality is included.
3. Geology, mineral resources and environmental geology of the Palmyra quadrangle, Lebanon and Dauphin Counties: Pennsylvania Geological Survey, 4th ser., Atlas 157d, 46 p., illus. including geologic map, **1970.** A complete geologic description is given for the area. The mineral resources, including limestone, dolomite, and clay shales, are discussed.
4. Water well records go to the computer: Pennsylvania Geology, v. 1, no. 5, p. 7-8, illus., **1970.** Well completion records, collected from Pennsylvania drillers since 1966, are being computerized. Printouts are available for certain counties.
5. (and Lapham, D. M.). Pennsylvania's first mineral industry: Pennsylvania Geology, v. 1, no. 6, p. 11-12, illus., **1970.** Vera Cruz, Lehigh County, may have

been the home of Pennsylvania's mineral industry. Delaware Indians mined jasper here prior to 1701 and the arrival of white settlers.

6. (and Shirk, W. R.). Pennsylvania's secondary school earth science course—ten years of progress: Journal of Geological Education, v. 18, no. 3, p. 118–121, illus., **1970.** Earth science is now taught in most secondary schools. Problems of teacher training, curriculum materials, and program implementation that existed in 1958 are compared with those of 1970.
7. (and McGlade, W. G.). Environmental geology for land-use planning: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 2, 44 p., illus., **1972.** An explanation of what environmental geology is, why it is important, how it is used, and the major geologic factors involved.
8. Earthquake in Lancaster County: Pennsylvania Geology, v. 4, no. 1, p. 7, **1973.** The earthquake of December 7, 1972, in northern Lancaster County is reviewed.
9. Susquehanna Water Gaps—National Natural Landmark: Pennsylvania Geology, v. 4, no. 6, p. 15, illus., **1973.** The five water gaps along the Susquehanna River have been registered as a National Natural Landmark.
10. The history and mystery of the Pequea silver mines [Lancaster County]: Pennsylvania Geology, v. 7, no. 2, p. 2–5, illus., **1976.** The author traces the history of the mines, which were first used by Indians prior to 1643. The present (1976) owner of the property offers tours and mineral collecting for a fee.
11. (and Smith, Robert C., II, and Barnes, J. H.). Mineral collecting in Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 33, 4th ed., 260 p., illus., **1976.** The specific locations and available minerals at 63 localities in 31 counties are described. Also included are guidelines to mineral identification, collecting procedures, and lists of museums and mineral clubs in Pennsylvania.
12. Building stones of Pennsylvania's capital area: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 5, 47 p., illus., **1977.** The diversity and origin of the many different types of stone that make up the buildings of the State Capitol complex and other well-known historical structures of the greater Harrisburg area are described.
13. The devil in Pennsylvania: Pennsylvania Geology, v. 10, no. 1, p. 11–12, illus., **1979.** Over 30 geologic features in Pennsylvania include "Devil" in their name. A list is included.
14. (and Bolles, W. H.). Outstanding scenic geological features of Pennsylvania: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 7, 508 p., illus., **1979.** More than 350 outstanding geologic and scenic features are described. Included in the list are waterfalls, canyons, sand dunes, natural cliffs, water gaps, springs, high peaks, and bogs. The features are grouped according to physiographic province. The location of each feature is given by a written description and is also shown on a topographic map.
15. (and Socolow, A. A.). A sinkhole swallows a road before our very eyes: Pennsylvania Geology, v. 10, no. 2, p. 2–6, illus., **1979.** Sinkholes in south-central Pennsylvania are discussed, and a recently developed sinkhole near Hershey is shown pictorially.

See also Bolles, William H., 6, 7; Conrad, Barbara, 1; McGlade, William G., 2, 5, 6.

GIBBONS, JOHN R.

1. (and Schlossman, S.). Rock music: Natural History, v. 79, no. 1, p. 36–41, **1970.** This phenomenon, reported in Bucks County, is related to the interaction between earth minerals and their environment over very long periods of time.

GIBBS AND HILL, INC.

1. Youghiogheny River basin mine drainage pollution abatement project—Report of Phase I: Pennsylvania Department of Mines and Mineral Industries [Operation Scarlift Project SL 103], variously paginated, illus., **1969.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. Youghiogheny River basin mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 103, variously paginated, illus., **1971.** See annotation in entry 1 above.

GIDDINGS, M. TODD, JR.

1. A hydrologic budget of Spring Creek drainage basin, Centre County, Pennsylvania, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 86–87, **1971;** Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 86–87, **1971.**
2. Sanitary landfill site selection: Earth and Mineral Sciences, v. 40, no. 5, p. 38–39, illus., **1971.** Because of pollution concerns, the locating of landfill sites is extremely important.
3. Hydrologic budget of Spring Creek drainage basin, Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1974;** [abs.], Dissertation Abstracts International, v. 35, no. 12, pt. 1, p. 5946B, **1975.**
4. The Lycoming County, Pennsylvania, sanitary landfill: state-of-the-art in groundwater protection: Ground Water, v. 15, no. 1, p. 5–14, illus., **1977.** A 120-acre sanitary-landfill site is being developed in north-central Pennsylvania to serve a six-county area. Methods used to prevent water contamination by leachate are described.

See also Gold, David P., 1.

GIFFIN, EMILY B.

1. Second Geological Survey fossil collection curated: Pennsylvania Geology, v. 6, no. 3, p. 10, illus., **1975.** Approximately 6,200 fossil specimens were cleaned, labeled, and put into catalog order in the William Penn Memorial Museum, Harrisburg.
2. A McKenzie eurypterid: Pennsylvania Geology, v. 9, no. 1, p. 10–12, illus., **1978.** A eurypterid specimen, one of the rarest fossils found in Pennsylvania, was discovered in the McKenzie Member of the Mifflintown Formation in Montour County.
3. A thelodont agnathid fauna from the Silurian of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 44, **1978.**
4. Silurian vertebrates from Pennsylvania: Journal of Paleontology, v. 53, no. 2, p. 438–445, illus., **1979.** An agnathan fish fauna was collected from the Late Silurian Bloomsburg Formation of central Pennsylvania. These thelodonts from a marginally marine environment are the first verified from the United States, and support the argument for the closure of the proto-Atlantic Ocean by Late Silurian time.

GILBERT, BRUCE K.

1. (and Kammerer, J. C.). Hydrology of the Genesee River basin, New York and Pennsylvania: U.S. Geological Survey Hydrologic Investigations Atlas HA-368, scales 1:250,000 and 1:760,320, 4 sheets, **1971.** The hydrology of the bedrock and unconsolidated sand and gravel deposits is described. Water availability, use, and quality are discussed; selected analyses are included. Flood, average, and low-flow frequencies of the Genesee River are presented.

GILETTI, B. J., *see* Hofmann, A. W., 1.

GILL, GRETA

1. (and Wright, T. O.). Deformation in the basal Martinsburg Formation near Mechanicsburg, Pennsylvania [abs.]: Pennsylvania Academy of Science Proceedings, v. 53, no. 1, p. 109, **1979.**

See also Wright, Thomas O., 8.

GILLESPIE, B. D., *see* Schopp, R. D., 1.

GILLESPIE, WILLIAM H.

1. (and Hennen, G. J., and Balasco, Charles). Plant megafossils from Dunkard strata in northwestern West Virginia and southwestern Pennsylvania, *in* Barlow, J. A., and Burkhammer, Susan, eds., Proceedings of the First I. C. White Memorial Symposium [Morgantown, W. Va., 1972]—"The age of the Dunkard": West Virginia Geological and Economic Survey, p. 223-248, illus., **1975.** The early published works on the plant fossils of the Dunkard strata are synthesized with current studies. It is suggested that either the Dunkard should be accepted as being of Pennsylvanian age or all sediments above the Ames limestone of Conemaugh age should be regarded as Permian.

See also Clendening, John A., 6; Pfefferkorn, Hermann W., 1.

GILLETTE, DAVID D.

1. Catalogue of type specimens of fossil vertebrates, Academy of Natural Sciences, Philadelphia—Introduction and Part I: Marine mammals: Academy of Natural Sciences of Philadelphia Proceedings, v. 127, p. 63-66, **1975.** The collection of vertebrates consists of more than 15,000 catalogued entries, including an estimated 400 type sections. Part I includes a catalogue listing 39 species names based on type specimens in the Academy.
2. (and Colbert, E. H.). Catalogue of type specimens of fossil vertebrates, Academy of Natural Sciences, Philadelphia—Part II: Terrestrial mammals: Academy of Natural Sciences of Philadelphia Proceedings, v. 128, p. 25-28, **1976.** Included are 143 species names based on type specimens of fossil terrestrial mammalia. For many of the specimens, this report marks the first notice concerning their existence and status subsequent to the original descriptions.
3. Catalogue of type specimens of fossil vertebrates, Academy of Natural Sciences, Philadelphia—Part IV: Reptilia, Amphibia, and tracks: Academy of Natural Sciences of Philadelphia Proceedings, v. 129, p. 101-111, **1978.** Included are 92 species based on type specimens of fossil reptiles, amphibians, and tracks. For most of the specimens, this report marks the first notice concerning their existence and status subsequent to the original descriptions.
4. Catalogue of type specimens of fossil vertebrates, Academy of Natural Sciences, Philadelphia—Part VI: Index, additions, and corrections: Academy of Natural Sciences of Philadelphia Proceedings, v. 129, p. 203-211, **1978.**

5. (and Shapiro, E. A.). Catalogue of type specimens of fossil vertebrates, Academy of Natural Sciences, Philadelphia—Part V: Fishes: Academy of Natural Sciences of Philadelphia Proceedings, v. 129, p. 113–123, **1978.** Included are 104 species names based on type specimens of fossil fishes. For most of the specimens, this report marks the first notice concerning their existence and status subsequent to the original descriptions.

See also Olson, Storrs L., 1.

GILLIES, NOLA P.

1. Ground-water protection in Pennsylvania—A model state program: Port Washington, N. Y., Geraghty and Miller Inc., 15 p., illus., **1974** [not seen].

GILLILAND, JOHN H.

1. Sinkholes at the Eisenhower interchange, 1–83, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 74–75, illus., **1978.** A very brief description and map of sinkholes located prior to construction of the interchange.

GINSBURG, MARILYN

1. Hydrology of the Triassic basin, Pennsylvania: Binghamton, State University of New York, M.A. thesis, **1970.**

GIORGETTI, LEO, *see* Paone, James, 1.

GLAESER, J. DOUGLAS

1. Correlation of Catskill sedimentary environments and its economic significance [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 21, **1970.**
2. Delta front evolution of Catskill deposits in the central Appalachian basin [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 165–166, **1973.**
3. Pocono boundary discrepancy between eastern and western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 166, **1973.**
4. Alternative sedimentary associations of uranium in Devonian Catskill deposits, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 29, **1974.**
5. Upper Devonian stratigraphy and sedimentary environments in northeastern Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 63, 89 p., illus., **1974.** Surface and subsurface data were used to develop a three-dimensional picture of the distribution of the complex sedimentary environments represented by the Upper Devonian rocks.
6. Devonian slope sediments in central Appalachian basin—source and reservoir deposits [abs.]: American Association of Petroleum Geologists Bulletin, v. 62, no. 3, p. 517, **1978.**
7. Catskill delta slope sediments in the central Appalachian basin—source deposits and reservoir deposits, *in* Doyle, L. J., and Pilkey, O. H., eds., Geology of continental slopes: Society of Economic Paleontologists and Mineralogists Special Publication 27, p. 343–357, illus., **1979.** Catskill delta slope development has sufficient numbers of sedimentary analogues to the constructional sequences within the continental slope of eastern North America that the abundant surface and subsurface data from this ancient clastic wedge provide keys to the sedimentary history of the margin.

8. Contrasts of delta development in differing tectonic settings exemplified by Queenston and Catskill clastic wedges [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 14–15, **1979.**
9. Environments for sedimentary uranium in Triassic-Jurassic basins, eastern North America [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 5, p. 827, **1979.**

See also Epstein, Jack B., 8.

GLASER, E. R.

1. (and Suffet, I. H.). Sampling design, collection and analysis of watershed soil samples for water resources management, *in* Krizek, R. J., and others, eds., Measuring and sensing methods: Ann Arbor, Mich., Ann Arbor Science Publications, v. 1, p. 379–399, illus., **1975** [not seen].

GLASS, GARY B.

1. Limonite concretions in Clearfield County: Pennsylvania Geology, v. 1, no. 8, p. 8–9, illus., **1970.** A mineral-collecting locality in the Houtzdale quadrangle yields limonite, coal, and siderite.
2. Channel sandstones in coal: Pennsylvania Geology, v. 2, no. 5, p. 4–6, illus., **1971;** reprinted *in* Root, S. I., compiler, Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey, 4th ser., Information Circular 84, p. 28–30, **1979.** The Kittanning fluvial sandstone, which overlies the Clarion coal, is described. Because fluvial sandstones often unexpectedly cut out coal due to the natural course of the ancient stream channel, locating the sandstone channel minimizes mining costs.
3. Computer program for coal analyses: Pennsylvania Geology, v. 2, no. 2, p. 7–9, **1971.** A computer program was designed to perform the necessary calculations and print out the upgraded analyses for moisture-free and moisture-and-ash-free core samples of coal.
4. Over 2,000,000 tons of coal from 8 in Pennsylvania: Pennsylvania Geology, v. 2, no. 5, p. 15, **1971.** Eight mines in Pennsylvania produced over 2,000,000 tons of coal in 1970.
5. Wrench faulting in the Appalachian Plateaus of Pennsylvania: Pennsylvania Geology, v. 2, no. 3, p. 7–11, illus., **1971.** Mapping outlined a 24-mile-long zone of intense faulting in parts of Centre, Clearfield, and adjacent counties.
6. Geology and mineral resources of the Philipsburg 7½-minute quadrangle, Centre and Clearfield Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 95a, 241 p., illus. including geologic map, **1972.** The surface and subsurface rocks of the 56-square-mile area are described. Rock and mineral resources and their economic importance are emphasized.
7. Contrasting the effects of coal mining in Wyoming and Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 57, no. 5, p. 957, **1973.**
8. (and Edmunds, W. E., Shepps, V. C., Inners, J. D., and Sholes, M. A.). Geology and mineral resources of the Ramey and Houtzdale quadrangles, Clearfield and Centre Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 85cd, 94 p., illus. including geologic map, **1977.** The nature and distribution of the surface and subsurface rocks are described. Particular attention is paid to the mineral resources that have economic importance.

See also Skema, Viktoras W., 1.

GLASSEY, RICHARD D.

1. (and Brown, J. M.). Geology of the East Hempfield area, Lancaster Co., Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1970.**

GLOVER, ALBERT D.

1. Geology and mineral resources of the southern half of the Clearfield 15-minute quadrangle [Clearfield County], Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 84cd, 139 p., illus. including geologic map, **1970.** The stratigraphy, structural geology, and mineral resources of the area are discussed. Coal is the most important mineral resource. A detailed geologic map, structure contours, cross section, generalized stratigraphic section, and coal-reserve maps are included.
2. (and Bragonier, W. A.). Geology and mineral resources of the Hazen, Falls Creek, Reynoldsville, and DuBois quadrangles, Clearfield and Jefferson Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 64, 131 p., illus. including geologic map, **1978.** See annotation in entry 1 above.

See also Berg, Thomas M., 7; Skema, Viktoras W., 1, 2.

GODARD, R. R.

1. Mine water treatment—Frick district [Crawford County]: Mining Congress Journal, v. 56, no. 3, p. 36–40, illus., **1970.** Treatment of acid mine water occurred in Pennsylvania as early as 1913. Historical methods are cited and current activities discussed.

GOHN, GREGORY S.

1. Metasedimentary units of the Marburg Formation, York County, Pennsylvania: Newark, University of Delaware, M.S. thesis, **1973.**
2. (and John, Chacko). Ichnofossils and the bathymetry of sedimentary facies in the Chickies Formation, York County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 30–31, **1974.**
3. (and Thompson, A. M.). Lithofacies in the Marburg and Wissahickon Formations near the Martic Line, York and Lancaster Counties, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 31, **1974.**
4. Sedimentology, stratigraphy, and paleogeography of lower Paleozoic carbonate rocks, Conestoga Valley, southeastern Pennsylvania: Newark, University of Delaware, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 37, no. 5, p. 2122B–2123B, **1976.**
5. (and Reinhardt, Juergen). Platform and basin lithofacies in Lower Cambrian carbonate rocks—Tomstown and Vintage Dolomites, central Appalachians [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 182, **1976.**
6. Revised ages of Cambrian and Ordovician formations of the Conestoga Valley near York and Lancaster, southeastern Pennsylvania, *in* Sohl, N. F., and Wright, W. B., Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1977: U.S. Geological Survey Bulletin 1457-A, p. A94–A97, illus., **1978.** In this summary article concerning the biostratigraphic data for the Conestoga Valley, the author concludes that the information remains sparse and inconclusive. The best age assignment for the Conestoga Limestone at present is Middle(?) Cambrian to Early Ordovician(?).

GOLD, DAVID P.

1. (and Parizek, R. R., and Giddings, T., Jr.). Water well explosions: an environmental hazard: Earth and Mineral Sciences, v. 40, no. 3, p. 17–21, illus., **1970.** A case study of a well explosion in Centre County that was caused by gas contamination. Conclusions are reached and recommendations given to prevent this problem in the future.
2. (and Parizek, R. R., and Alexander, S. A. [sic]). Analysis and application of ERTS-1 data for regional geologic mapping, *in* Symposium on significant results obtained from the Earth Resources Technology Satellite-1, Volume I, Technical

presentations, Section A: U.S. National Aeronautics and Space Administration Special Publication 327, p. 231–245, illus., **1973.** The utility of using ERTS data for regional geologic mapping was tested by examining a few well-known areas and classifying the linear transgressive features apparent on all scales of overflight imagery.

3. (and Alexander, S. S., and Parizek, R. R.). Application of remote sensing to natural resource and environmental problems in Pennsylvania: Earth and Mineral Sciences, v. 43, no. 7, p. 49–53, **1974.** A summary of the various ways in which ERTS-1, Skylab, and low-altitude aerial photography can be used to investigate mineral resources, land use, and environmental problems.
4. (and Parizek, R. R.). Field guide to lineaments and fractures in central Pennsylvania: International Conference on New Basement Tectonics, 2nd, Newark, Del., University of Delaware, Guidebook, 75 p., illus., **1976.** A collection of field trips, based on current thesis research and previously published guidebooks. For the first day of the trip, a cross section is developed through the major tectonic and physiographic provinces of southeastern Pennsylvania in order to illustrate the structural framework of the central Pennsylvania region. The field stops for the second day pertain to the hydrologic and structural aspects of lineaments, as well as their economic and engineering implications.
5. (and Alexander, S. S., and Parizek, R. R.). Major cross strike structures in Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 4, p. 170, **1978.**
6. (and Parizek, R. R.). A study of lineaments, fracture traces and joints in Pennsylvania [abs.], *in* Podwysocki, M. H., and Earle, J. L., eds., Proceedings of the Second International Conference on Basement Tectonics [Newark, Del., 1976]: Denver, Colo., Basement Tectonics Committee, p. 142, **1979.**

See also Alexander, Shelton S., 1, 2; Canich, Michael R., Jr., 2; Kowalik, William S., 3, 4; Krohn, M. Dennis, 1, 2; Parizek, Richard R., 9.

GOLDFARB, RICHARD J.

1. The effects of land use on water quality and erosion rates in small watersheds of central Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1975.**

GOLDTHWAIT, RICHARD P., *see* Dreimanis, Aleksis, 1.

GOMEZ, MANUEL

1. (and Hazen, Kathleen). Evaluating sulfur and ash distribution in coal seams by statistical response surface regression analysis: U.S. Bureau of Mines Report of Investigations 7377, 120 p., illus., **1970.** The purpose of this study was to evaluate the feasibility of using statistical response surface regression to predict sulfur and ash distribution and washability characteristics of coal along a seam in advance of mining. The Pittsburgh seam in Greene County was used for the study.
2. (and Donaven, D. J.). Forecasts of chemical, physical, and utilization properties of coal for technical and economic evaluation of coal seams: U.S. Bureau of Mines Report of Investigations 7842, 127 p., illus., **1974.** A computerized statistical approach is used to interpolate coal seam characteristics between sample points for the Pittsburgh seam in southwestern Pennsylvania and adjacent areas. A computer program is appended.
3. (and Donaven, D. J., and Kent, B. H.). Distribution of sulfur and ash in a part of the Pittsburgh seam and probable mode of deposition: U.S. Bureau of Mines Report of Investigations 7827, 44 p., illus., **1974.** The distribution of sulfur and

ash is shown in relation to the probable origin of the Pittsburgh coal, influenced by paleotopography.

See also Kent, Bion H., 2, 4.

GONG, HENRY

1. The geochemistry of cadmium: University Park, Pennsylvania State University, M.S. thesis, **1975.**
2. (and Rose, A. W., and Suhr, N. H.). The geochemistry of cadmium in some sedimentary rocks: Geochimica et Cosmochimica Acta, v. 41, no. 12, p. 1687–1692, illus., **1977.** It was determined that the primary cause of cadmium enrichment in the sedimentary environment is the adsorption and/or complexation of cadmium with organic matter, followed by the accumulation of organic debris in a reducing depositional environment.

GOOCH, JAMES L., *see* Hetrick, Steven W., 1.

GOODMAN, JIMELL, *see* Jones, Jeri L., 2.

GOODMAN, T. W., *see* Fields, H. H., 1.

GOODWIN, PETER W.

1. Lower Ordovician conodonts from the Axemann Limestone in central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 5, p. 322–323, **1972.**
2. (and Anderson, E. J.). Associated physical and biogenic structures in environmental subdivision of a Cambrian tidal sand body: Journal of Geology, v. 82, no. 6, p. 779–794, illus., **1974.** The depositional environment of the Chickies Quartzite is explained on the basis of the sedimentary and biogenic structures present. Several facies are identified.
3. (and Anderson, E. J.). Paleogeography of a Cambrian clastic tidal flat [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 32, **1974.**
4. (and Anderson, E. J.). The Middle Ordovician of Pennsylvania: a test of the hypothesis that all deposition occurs as punctuated aggradational cycles [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 45, **1978.**

See also Adams, John K., 1; Barwis, John H., 3; Manns, Francis T., 1; Tipnis, Ravindra S., 1; Wagner, John R., 1.

GORDON, MACKENZIE, JR., *see* Flower, Rousseau H., 1.

GORDON, RICHARD L.

1. The coal industry in the seventies—can the comeback continue?: Earth and Mineral Sciences, v. 40, no. 2, p. 13–14, **1970.** The decline of the coal industry is summarized and the steps being taken to restore it are outlined.

GORTON, WILLIAM T., *see* Mentz, John W., 1, 2, 3, 4, 5, 6.

GOTH, JOSEPH H., *see* Lytle, William S., 3.

GOTTFRIED, DAVID

1. (and Rowe, J. J., and Tilling, R. I.). Dillsburg and Cornwall districts, Pennsylvania, *in* Distribution of gold in igneous rocks: U.S. Geological Survey Professional Paper 727, p. 27–28, **1972.** A brief discussion of the origin of gold at Dillsburg and Cornwall is included in this nationwide study. These localities are

illustrative of occurrences in which the concentration of gold is not dependent on primary abundance.

GOUGH, WILLIAM R.

1. The geology and water resources of the Milesburg-Sayer Dam area [Centre County], Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1977.**

See also Waite, Burt A., 1.

GRABOWSKI, GEORGE J., JR.

1. An analysis of the factors affecting the distribution and importance of the major forest species throughout the Rapid Run basin, Valley and Ridge province, central Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

GRANDSTAFF, B. E., *see* Myer, George H., 1.

GRANDSTAFF, D. E., *see* Myer, George H., 1.

GRANT, RAYMOND W.

1. (and Montgomery, Arthur). Pennsylvania minerals (24): Keystone Newsletter, v. 13, no. 11, p. 4–5, **1964.** Cryptomelane and rockbridgeite were identified from a locality near Hellertown, Northampton County.
2. Pennsylvania minerals (97): Keystone Newsletter, v. 20, no. 1, p. 10, **1971.** Bianchite, found in the Ueberroth mine at Friedensville, Lehigh County, is discussed.
3. Pennsylvania minerals (98): Keystone Newsletter, v. 20, no. 2, p. 9, **1971.** Paragonite is described. The only known occurrence in Pennsylvania is in the vicinity of Corundum Hill, northeast of Unionville (Chester County).
4. Pennsylvania minerals (99): Keystone Newsletter, v. 20, no. 3, p. 10, **1971.** Nepheline and cancrinite, new minerals to Pennsylvania, were located in the contact metamorphic rocks at Point Pleasant, Bucks County.
5. Pennsylvania minerals (101): Keystone Newsletter, v. 20, no. 5, p. 7, **1971.** Boehmite, awaruite, and heazlewoodite are new minerals added to Pennsylvania's list of known minerals.
6. Pennsylvania minerals (102): Keystone Newsletter, v. 20, no. 6, p. 10, **1971.** A discussion of minerals that have been reported from Pennsylvania but need clarification.
7. Pennsylvania minerals (103): Keystone Newsletter, v. 20, no. 7, p. 9–10, **1971.** Coeruleolactite, incorrectly identified previously, should be removed from the list of Pennsylvania minerals.
8. Pennsylvania minerals (115): Keystone Newsletter, v. 21, no. 7, p. 10, **1972.** The mineralogy and geochemistry of a cobaltite specimen from the Kibblehouse quarry at Perkiomenville, Montgomery County, are discussed.
9. Pennsylvania minerals (118): Keystone Newsletter, v. 21, no. 10, p. 10, **1972.** Manganese minerals in Pennsylvania are discussed.
10. Pennsylvania minerals (119): Keystone Newsletter, v. 21, no. 11, p. 7, **1972.** The geochemistry and geologic setting for huntite, which has been found at the Cedar Hill quarry in Lancaster County, are described.
11. Pennsylvania minerals (122): Keystone Newsletter, v. 22, no. 2, p. 9–10, **1973.** A revised, up-to-date list of verified mineral species in Pennsylvania is presented.
12. Pennsylvania minerals (123): Keystone Newsletter, v. 22, no. 3, p. 7–10, **1973.** A revised list of Pennsylvania minerals is presented, indexed to preceding issues of the "Pennsylvania minerals" column.

13. Pennsylvania minerals (124): Keystone Newsletter, v. 22, no. 4, p. 8-9, illus., **1973.** Variscite, previously mislabeled by some collectors as pectolite, was identified from Cumberland County.
14. Pennsylvania minerals (134): Keystone Newsletter, v. 23, no. 2, p. 4, **1973.** Four minerals—jarosite, datolite, thomsonite, and cobaltite—from the French Creek mines in Chester County are described.
15. Pennsylvania minerals (135): Keystone Newsletter, v. 23, no. 3, p. 5-6, **1974.** Minerals occurring at burning coal mines are listed, along with localities and bibliographic references.
16. Pennsylvania minerals (136): Keystone Newsletter, v. 23, no. 4, p. 6, **1974.** Minerals found at burning coal mines are discussed. A locality in Berks County is listed for cobaltite.
17. Pennsylvania minerals (137): Keystone Newsletter, v. 23, no. 5, p. 6, **1974.** Problems associated with compiling a list of Pennsylvania minerals are discussed.
18. Pennsylvania minerals (138): Keystone Newsletter, v. 23, no. 6, p. 7, **1974.** Subdivision of the tourmaline, olivine, apatite, and scapolite groups is discussed in reference to the compilation of a list of Pennsylvania minerals.
19. Pennsylvania minerals (139): Keystone Newsletter, v. 23, no. 7, p. 6, **1974.** Revisions have been made to the Pennsylvania mineral list. Prochlorite has been changed to ripidolite, and attapulgite to palygorskite. Boussingaultite, alunite, ulvöspinel, pumpellyite, langite, and posnjakite have been added to the list. Localities are given.
20. Pennsylvania minerals (140): Keystone Newsletter, v. 23, no. 8, p. 6, **1974.** Five minerals—awaruite, heazlewoodite, perovskite, uvarovite, and stevensite—have been removed from the Pennsylvania list until verified.
21. Pennsylvania minerals (141): Keystone Newsletter, v. 23, no. 9, p. 4, **1974.** Six additional minerals to be added to the Pennsylvania minerals list are acanthite, enargite, cornubite, conichalcite, jordanite, and pseudomalachite.

GRANT, VIRGINIA, *see* Eaton, Andrew D., 1.

GRAUCH, RICHARD I.

1. (and Ludwig, K. R.). Uranium mineralization at Easton, Pennsylvania: Pennsylvania Geology, v. 10, no. 5, p. 14-16, illus., **1979.** A report of a uranium reconnaissance study, this article summarizes the occurrences at various quarries in Precambrian serpentinized dolomite marble in the Easton area (Northampton County).

GRAUERT, BORWIN W.

1. (and Crawford, M. L., and Wagner, M. E.). U-Pb isotopic analyses of zircons from granulite and amphibolite facies rocks of the West Chester Prong and the Avondale anticline, southeastern Pennsylvania: Carnegie Institute of Washington Yearbook, no. 72, p. 290-293, illus., **1973.** Using U-Pb ratios found in zircon crystals, an attempt was made to date the Baltimore Gneiss. The results suggest that a strong Paleozoic metamorphism existed and caused the high radiogenic lead loss found in the crystals.
2. (and Wagner, M. E.). Age of the granulite-facies metamorphism of the Wilmington Complex, Delaware-Pennsylvanian [sic] Piedmont: Carnegie Institute of Washington Yearbook, no. 73, p. 997-999, illus., **1974.** An investigation of the origin of the granulite-facies metamorphism.
3. (and Wagner, M. E., and Crawford, M. L.). Age and origin of amphibolite-facies rocks of the Avondale anticline (southeastern Pennsylvania) as derived from

U-Pb isotopic studies on zircon: Carnegie Institute of Washington Yearbook, no. 73, p. 1000–1003, illus., **1974.** The authors tried to date the metamorphic events and to determine if the Precambrian metamorphics of the Baltimore Gneiss belong to the same basement or were formed during different times.

4. (and Wagner, M. E.). Age of the granulite-facies metamorphism of the Wilmington Complex, Delaware-Pennsylvania Piedmont: American Journal of Science, v. 275, no. 6, p. 683–691, illus., **1975.** The age of the Wilmington Complex has been estimated to be 440 m.y., as indicated by the granulite-facies metamorphism.

GRAY, CARLYLE, *see* Lapham, Davis M., 15.

GRAY, RICHARD E.

1. Landslides, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 103–105, illus., **1970.** Landslides are discussed in general terms, and specific examples of problems occurring in the Pittsburgh area are cited.
2. Mine subsidence, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 111–116, illus., **1970.** Ground-surface effects of room-and-pillar coal-mining methods used in Allegheny County are discussed. Methods of stabilizing ground beneath buildings and general aspects of the 1966 Bituminous Mine Subsidence Act are explained.
3. (and Meyers, J. F.). Mine subsidence and support methods in Pittsburgh area: American Society of Civil Engineers Proceedings, v. 96, paper 7407, Journal of the Soil Mechanics and Foundations Division, no. SM 4, p. 1267–1287, illus., **1970.** The Pittsburgh area exhibits two distinct subsidence problems—active mining and structures located over old mine workings. Methods of support are reviewed and examples of subsidence damage and support methods are presented as case histories.
4. Mine subsidence, support, and stabilization in western Pennsylvania: Geological Society of America, Annual Meeting, Field Trip Guidebook, v. 1971, no. 6, p. 25–35, illus., **1971** [not seen].
5. (and Ferguson, H. F., and Hamel, J. V.). Slope stability in the Appalachian Plateau, Pennsylvania and West Virginia, U.S.A., *in* Voight, Barry, ed., Rockslides and avalanches, Part II—Engineering sites: Amsterdam, Elsevier Scientific Publishing Company, p. 447–471, illus., **1979** [not seen].

See also Salver, Henry A., 1; Wagner, Walter R., 6.

GREEN ENGINEERING COMPANY

1. Mine drainage abatement survey, Yellow Creek watershed, Butler County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 158, 31 p., variously paginated appendices, illus., **1974.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed and recommendations for abatement. Information pertaining to strip mines and deep-mine openings and a very brief description of the geology are also included.

GREENE, HOWARD J.

1. Remote sensing as a tool in terrain analysis: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

GREENFIELD, B. JAMES, *see* El Ashmawi, N., 1.

GREENFIELD, R. J.

1. (and Stoyer, C. H.). Tracing ground water by geophysical methods: Society of Mining Engineers, Preprint 73-F-346, **1973.**
2. (and Shuck, L. Z., and Keech, T. W.). Hydraulic fracture mapping using electrical potential measurements: In Situ, v. 1, no. 2, p. 147–169, illus., **1977** [not seen].

See also Lavin, Peter M., 1.

GREGO, J. A., *see* Tatlock, D. B., 1.

GREGORY, GARDINER E.

1. Mineral locations in Pennsylvania: Gems and Minerals, no. 397, p. 24–27, 49, illus., October **1970.** Lists some of the better mineral- and fossil-collecting sites that were available in 1970. (Many of these sites have since been closed to collectors.)

GRESH, ROGER

1. Mercury in stream sediments from Conestoga Creek, southeastern Pennsylvania: Lancaster, Pa., Franklin and Marshall College, M.S. thesis, **1972.**

GRICE, DARRELL G.

1. (and Grubb, R. G., and Jaquish, O. W.). Soil survey of Mercer County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 73 p., illus. including soils maps, **1971.** Includes detailed descriptions and maps of the soils, as well as sections on use and management, and formation and classification of the soils.

GRIFFITH, THOMAS W.

1. Energy from Appalachian coalbed methane: California, Pa., California State College, M.S. thesis, **1979.**

GROSHONG, RICHARD H., JR.

1. Strain in minor folds, Valley and Ridge province, Pennsylvania: Providence, R. I., Brown University, Ph.D. thesis, **1971**; [abs.], Dissertation Abstracts International, v. 32, no. 9, p. 5254B, **1972.**
2. Strain in natural single-layer folds [abs.]: EOS (American Geophysical Union Transactions), v. 52, no. 4, p. 345, **1971.**
3. Martinsburg slaty cleavage caused by pressure solution [abs.]: EOS (American Geophysical Union Transactions), v. 55, no. 4, p. 436, **1974.**
4. Strain, fractures, and pressure solution in natural single-layer folds: Geological Society of America Bulletin, v. 86, no. 10, p. 1363–1376, illus., **1975.** Intragranular strain was measured by the twinned calcite strain-gage technique for three single-layer minor folds in central Pennsylvania.

See also Teufel, Lawrence W., 1.

GROSS, DAVID L.

1. (and Moran, S. R.). Grain-size and mineralogical gradations within tills of the Allegheny Plateau, *in* Goldthwait, R. P., ed., Till—A symposium: Columbus, Ohio State University Press, p. 251–274, illus., **1971.** Grain-size and feldspar components of Lavery, Kent, and Titusville Tills (Wisconsinan) vary regularly in the southeastern direction of ice transport. Areal and vertical variations within till sheets are related to ice flow and bedrock.

GROSS, M. G.

1. (and Karweit, M., Cronin, W. B., and others). Suspended sediment discharge of the Susquehanna River to northern Chesapeake Bay, 1966 to 1976: Estuaries, v. 1, no. 2, p. 106–110, illus., **1978.** There is no compelling evidence that coal mining has had any large-scale effects on sediment yields in the drainage basin, but future increases in levels of mining or in urbanization could increase the local sediment yield and eventually affect the bay.

See also Eaton, Andrew D., 1.

GROWITZ, DOUGLAS J.

1. (and Lloyd, O. B., Jr.). Relationship between ground-water levels and quality in shallow observation wells, Muddy Creek basin, southeastern York County, Pennsylvania, *in* Geological Survey research 1971, Chapter D: U.S. Geological Survey Professional Paper 750-D, p. D178–D181, illus., **1971.** A direct relationship was found to exist between groundwater levels and specific conductance of groundwater in 13 shallow observation wells.
2. Map showing approximate depth to water level in the shallow aquifer, April 30 to May 1, 1974, and the potential of basement flooding in the Kingston area [Luzerne County], Pennsylvania, April 30 to May 1, 1974: U.S. Geological Survey Open-File Report 74–122, 1 sheet, **1974** [not seen].
3. Ground-water conditions in the Kingston area, Luzerne County, Pennsylvania, and their effect on basement flooding: U.S. Geological Survey Open-File Report 76–793, 112 p., illus., **1976** [not seen].
4. Hydrogeologic factors that may affect mine drainage in the anthracite region of Pennsylvania, eastern United States, *in* Fernandez-Rubio, R., and others, eds., El agua en la mineria y trabajos subterraneos: Asociacion Nacional Ingenieros de Minas, Spain, v. 1–3, p. 153–172, illus., **1978** [not seen].

See also Lloyd, Orville B., Jr., 1, 2; Ott, A. N., 1.

GRUBB, ROBERT G., *see* Grice, Darrell G., 1; Yaworski, Michael, 1.

GUBER, ALBERT L.

1. Pyritic sulfur as a paleoecologic indicator in Carboniferous cycles, *in* Stratigraphy and sedimentology: International Geological Congress, 24th, Montreal, Canada, 1972, Proceedings, Sec. 6, p. 389–396, illus., **1972;** [abs.], International Geological Congress, 24th, Montreal, Canada, 1972, Abstracts, p. 186, **1972.** Sulfur content was analyzed in six stratigraphic sections in western Pennsylvania. The sections included the Lower Kittanning coal and superjacent strata. A significant association between *Lingula* and high-sulfur content was found. The author proposes that, because *Lingula* and high sulfur content characterized brackish-water environments, the variation in sulfur abundance can be used as an indicator of the limits of brackish environment in Carboniferous transgressive-regressive coal-bearing cycles in western Pennsylvania.

GUGGENHEIM, STEPHEN

1. (and Bailey, S. W.). Refinement of the margarite structure in subgroup symmetry: American Mineralogist, v. 60, no. 11–12, p. 1023–1029, illus., **1977.** The crystal structure of margarite-2M, from Corundum Hill near Unionville, Chester County, has been refined as an ordered derivative structure in subgroup *Cc* of the ideal space group *C*2/c.

GUILDAY, JOHN E.

1. Appalachian bone caves, *in* White, W. B., ed., Geology and biology of Pennsylvania caves: Pennsylvania Geological Survey, 4th ser., General Geology Report

66, p. 88–103, illus., **1976.** The importance of caves in preserving the remains of animals is reviewed. Specific caves in York, Centre, Bedford, and Blair Counties are cited.

GUNN, J. D., *see* Adovasio, J. M., 1, 2, 3; Donahue, Jack D., 5, 6.

GUNNETT, J. W., *see* Lovell, Harold L., 2.

GUPTA, ARVIND B., *see* Secor, Edwin S., 1.

GUSWA, JOHN H.

1. Numerical simulation of the multilayered aquifer system in the Coastal Plain area, southeastern Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 37, no. 7, p. 3320B, **1977.**

GUTSCHICK, RAYMOND C.

1. (and Lamborn, Richard). ***Bifungites,*** trace fossils from Devonian-Mississippian rocks of Pennsylvania and Montana, U.S.A.: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 18, no. 3, p. 193–212, illus., **1975.** In northwestern Pennsylvania the biostratigraphic succession contains three characteristic forms of ***Bifungites.*** They were found at 18 localities in five stratigraphic units, about 390 m (1,280 ft) in thickness, in Upper Devonian and Lower Mississippian rocks.

See also Lamborn, Richard, 1, 2.

GWIN, DOBSON AND FOREMAN, INC.

1. Knox Township, Clarion County: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 193–1, 58 p., illus. [no date]. This open-file report is a "site evaluation" of approximately 80 acres of deep mines in order to determine what is needed to substantially abate acid mine drainage into Deer Creek.
2. West Branch Susquehanna River mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 163–3, 180 p., variously paginated appendices, illus., **1972.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
3. Knox Township, Clarion County: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 193–1, 26 p., unpaginated tables, **1973.** See annotation in entry 1 above.
4. Paint Township, Clarion County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project 191–1, 48 p., illus., **1973.** See annotation in entry 2 above.
5. Toby Township, Clarion County: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 194–1, 28 p., illus., **1976.** See annotation in entry 2 above.
6. Piney Creek, Clarion County, mine drainage pollution abatement study: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 192, 83 p., unpaginated appendix, illus., **1977.** See annotation in entry 2 above.
7. Deer Creek, Clarion County, mine drainage pollution abatement study: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 193, 126 p., unpaginated appendices, illus., **1978.** See annotation in entry 2 above.

8. Toby Creek, Clarion County, mine drainage pollution abatement study: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 191, 105 p., unpaginated appendices, illus., **1978.** See annotation in entry 2 above.

GWIN ENGINEERING AND ASSOCIATED DESIGN SERVICES

1. Mine drainage abatement project for the Mill Creek watershed, Clarion and Jefferson Counties, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 133-5, 379 p., illus., **1977.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

GWIN ENGINEERS, INC.

1. City of Altoona watershed, Horseshoe Curve area, Logan Township, Blair County, Pennsylvania: Pennsylvania Department of Mines and Mineral Industries, Operation Scarlift Project SL 116, 100 p., illus., **1968.** This open-file report concerns a study to improve the potability of water presently affected by acid mine drainage in the watershed area of Altoona and the watershed areas of nearby streams.
2. Slippery Rock Creek mine drainage pollution abatement project: Pennsylvania Department of Mines and Mineral Industries, Operation Scarlift Project SL 110, 168 p., unpaginated appendices, illus., **1970.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
3. Mine drainage abatement project for the Anderson Creek watershed, Clearfield County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 1-17:1-101.6, 153 p., variously paginated tables, illus., **1974.** See annotation in entry 2 above.

GWINN, VINTON E.

1. Kinematic patterns and estimates of lateral shortening, Valley and Ridge and Great Valley provinces, central Appalachians, south-central Pennsylvania, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 127-146, illus., **1970.** An attempt was made to prove that Precambrian basement crystalline rocks and the lowest portions of the sedimentary sequence did not participate concordantly in Paleozoic deformation observed in surface rocks in the outer part of the deformed geosyncline.

HACKMAN, R. J.

1. (and Thomas, R. E.). Landslides and related features, Ohio, West Virginia, and Pennsylvania—Clarksburg 1° by 2° sheet: U.S. Geological Survey Open-File Report 78-1056, 128 pls., engineering geologic maps, scale 1:24,000, **1978** [not seen].

HADLEY, DONALD G.

1. Paleocurrents in the upper part of the Allegheny Group and Conemaugh Formation, Blandburg quadrangle [Cambria County], central Pennsylvania, *in* Geological Survey research 1971, Chapter D: U.S. Geological Survey Professional Paper 750-D, p. D115-D121, illus., **1971.** Gathered information concerning the paleocur-

rent direction indicates that source rocks for the Allegheny and Conemaugh Groups lay to the southwest.

HADLEY, JARVIS B.

1. (and Devine, J. F.). Seismotectonic map of the eastern United States: U.S. Geological Survey Miscellaneous Field Studies Map MF-620, 8 p., 3 pls., scale 1:5,000,000, **1974.** The distribution of historic seismic activity in relation to geologic structures and tectonic provinces is discussed. A tectonic map, an earthquake epicenter map, and a seismotectonic map are included.

HAEFNER, RICHARD

1. A note on "lancasterite" from Cedar Hill & Texas, Pennsylvania: Mineralogical Record, v. 2, no. 1, p. 39–40, **1971.** This mineral, properly labeled brucite and hydromagnesite, is historically traced through the literature dating from 1850.
2. (and Banks, Harold). Observations of black humus and calcareous concretions in the flood plain of a small stream [Little Conestoga Creek, Lancaster County] [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 172, **1973.**

HAGER, G. MICHAEL, *see* Thompson, Allan M., 8.

HAJI-VASSILIOU, ANDREAS

1. (and Puffer, J. H.). A macrocrystalline attapulgite-palygorskite occurrence in calcite veins: American Mineralogist, v. 60, no. 3–4, p. 328–330, illus., **1975.** Attapulgite-palygorskite fibers were found in veins which represent fracture filling in a shear zone through Triassic siltstone (Brunswick Formation) near Limerick (Montgomery County). Recrystallization that took place during an episode of mild deformation or slippage along vein contacts is believed to have caused the macrocrystalline character of the occurrence.

HALL, WILLIAM

1. Carving through a mountain: Pennsylvania Naturalist, v. 2, no. 2, p. 36–37, illus., Dec. **1979**–Jan. **1980.** A nontechnical account of the river gap north of Harrisburg.

HALLAM, S. L., *see* Cotter, Edward, 3.

HAMEL, JAMES V.

1. Stability of slopes in soft, altered rocks: University of Pittsburgh, Ph.D. thesis, **1970;** [abs.], Dissertation Abstracts International, v. 31, no. 5, p. 2664B, **1970.**
2. The slide at Brilliant Cut, *in* Stability of rock slopes: Symposium on Rock Mechanics, 13th, Proceedings, Society of Mining Engineers-American Institute of Mining, Metallurgical, and Petroleum Engineers, p. 487–510, illus., **1972** [not seen].
3. (and Long, S. B., and Ferguson, H. F.). Mahoning Dam foundation re-evaluation, *in* Rock engineering for foundations and slopes—Proceedings of a specialty conference: American Society of Civil Engineers, v. 1, p. 217–243, illus., **1976** [not seen].

See also Flint, Norman K., 1, 2; Gray, Richard E., 5.

HAMERSMA, J. W., *see* Meyers, R. A., 1.

HAMMER, T. R.

1. Stream channel enlargement due to urbanization: RSRI (Regional Science Research Institute) Discussion Paper Series 55, 41 p., **1972** [not seen].

HANSON, HENRY

1. (and Buckham, Leslie, and Lowe, Rodger). Geochemistry of the Eaton-Dikeman Pond, Cumberland County, Pa. [abs.]: Pennsylvania Academy of Science Proceedings, v. 51, no. 1, p. 94, 1977.

HARDY, H. REGINALD, JR.

1. Microseismic techniques—Basic and applied research, *in* Geomechanics—Progress in theory and its effects on practice: Rock Mechanics, Supplementband 2, p. 93–114, 369–370, illus., 1973 [not seen].
2. (and Mowrey, G. L.). Study of microseismic activity associated with a longwall coal mining operation using a near-surface array: Engineering Geology, v. 10, no. 2–4, p. 263–281, illus., 1976 [not seen].
3. Monitoring the stability of geologic structures using near-surface microseismic transducers: Series on Rock and Soil Mechanics, v. 2, no. 3, p. 357–379, illus., 1977 [not seen].

HARGRAVES, ROBERT B., *see* McIntosh, William C., 1.

HARMON, RUSSELL S.

1. Application of stable carbon isotope studies to the investigation of karst processes [abs.]: National Speleological Society Bulletin, v. 33, no. 4, p. 146, 1971.
2. Stable carbon isotope geochemistry of some karst waters in central Pennsylvania [abs.]: Caves and Karst, v. 13, no. 5, p. 42, 1971.
3. The application of stable carbon isotope studies to karst research—Part II: An example from central Pennsylvania: Caves and Karst, v. 13, no. 4, p. 29–35, illus., 1971. Stable carbon isotopes can be used to determine relative hydrologic age of water and used to distinguish types of water in a karst system.This study, done in the Spring Creek drainage basin of Centre County, shows recharge at point sources.
4. The application of stable carbon isotope studies to karst research: reply: Caves and Karst, v. 14, no. 2, p. 13–16, illus., 1972.
5. Chemical and carbon isotopic evolution of carbonate waters in the Nittany Valley of central Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, 1973.
6. (and Langmuir, D., and Deines, P.). Diurnal variations in chemical and isotopic compositions of carbonate surface and ground waters [abs.]: EOS (American Geophysical Union Transactions), v. 54, no. 4, p. 260, 1973.

See also Deines, Peter, 1.

HARMS, JOHN C., *see* Walker, Roger G., 1, 3, 5.

HARMS, TEKLA A.

1. Jointing in the Newark basin, southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, 1977.
2. (and Stephens, G. C.). Jointing in the Newark basin, southeastern Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 53, no. 2, p. 198–200, illus., 1979. Joints in the Triassic rocks of southeastern Pennsylvania display a uniform regional orientation. The 14 outcrops used in this study show a consistent parallelism of well-developed planar joints. The authors tried to determine whether the locally observed joint parallelism was consistent throughout the basin and whether a unique stress event could be assigned to the formation of the observed joint sets.

HARPER, JOHN A.

1. (and Morris, R. W.). A new encrinasterid ophiuroid from the Conemaugh Group (Pennsylvanian) of western Pennsylvania, and revision of the Encrinasteridae: Journal of Paleontology, v. 52, no. 1, p. 155–163, illus., **1978.** *Armathyraster paradoxis* n. gen., n. sp., of the Pennsylvanian Brush Creek Shale of western Pennsylvania, has been assigned to the Encrinasteridae. Five possible functional interpretations of the pinnular ossicles are discussed.
2. (and Piotrowski, R. G.). Stratigraphy, extent, gas production, and future gas potential of the Devonian organic-rich shales in Pennsylvania, *in* Preprints—Second Eastern Gas Shales Symposium [Morgantown, W. Va., 1978]: U.S. Department of Energy Report METC/SP-78/6, v. 1, p. 310–329, illus., **1978.** Three major radioactive black shale units are present in the subsurface of Pennsylvania: the Upper Devonian Dunkirk and Rhinestreet Shales, and the Middle Devonian Marcellus Shale. Future potential for natural gas production exists in all three units.
3. Subsurface rock correlation diagram, Allegheny Plateau, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report, Pittsburgh office, 1 sheet, **1979.**
4. (and Piotrowski, R. G.). Devonian organic-rich black shales in subsurface Pennsylvania—stratigraphy and natural gas production [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 3, p. 462, **1979.**
5. (and Piotrowski, R. G.). Stratigraphic correlation of surface and subsurface Middle and Upper Devonian, southwestern Pennsylvania, *in* Dennison, J. M., and others, Devonian shales in south-central Pennsylvania and Maryland: Annual Field Conference of Pennsylvania Geologists, 44th, Bedford, Pa., Guidebook, p. 18–37, illus., **1979.** Gamma ray logs were used to correlate the subsurface Middle and Upper Devonian rocks of western Pennsylvania with the strata exposed at the surface in the south-central part of the state.
6. (and Piotrowski, R. G.). Structure contour map on top of the Middle Devonian Onondaga Group in western and northern Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 12, scale 1:250,000, 3 sheets, **1979.** The large map shows 500-foot contour intervals and all wells penetrating the Onondaga for the area west and north of the Allegheny Front.

See also Piotrowski, Robert G., 13, 14; Wagner, Walter R., 9, 10.

HARRINGTON, M. T.

1. A study of the textures and of the deformation of the sphalerite at Friedensville [Lehigh County], Pennsylvania: Ann Arbor, University of Michigan, M.S. thesis, **1976.**

HARRIS, ANITA G.

1. (and Harris, L. D., and Epstein, J. B.). Oil and gas data from Paleozoic rocks of the Appalachian basin: maps for assessing hydrocarbon potential and thermal maturity (conodont color alteration isograds and overburden isopachs): U.S. Geological Survey Miscellaneous Geological Investigations Map I-917-E, scale 1:2,500,000, 4 sheets, **1978.** The color alteration of conodonts is a measure of the degree of organic diagenesis. This is a factor in assessing the hydrocarbon potential of an area. This study includes three conodont color alteration maps for the Appalachian basin (includes Pennsylvania), and a summary of the oil and gas potential of the area.

See also Epstein, Anita G. F.; Epstein, Jack B., 2, 3.

HARRIS, LEONARD D.

1. Oil and gas data from the Lower Ordovician and Cambrian rocks of the Appalachian basin: U.S. Geological Survey Miscellaneous Geological Investigations Map I-917-D, scale 1:2,500,000, 3 sheets, **1975.** Sheet 1 has facies-relations cross sections, nomenclature and correlation chart, and text, for the area from Alabama to New York. Sheet 2 shows structure on top of the basement and the top of the Knox Group. Sheet 3 has references and an isopach map of the basement to the top of the Knox Group.
2. The Eastern Interior aulacogen and its relation to Devonian shale-gas production, *in* Preprints—Second Eastern Gas Shales Symposium [Morgantown, W. Va., 1978]: U.S. Department of Energy Report METC/SP-78/6, v. 2, p. 55-72, illus., **1978.** A generalized tectonic history of the Rome trough and its relation to gas production in the Devonian black shales of the Appalachian basin.
3. (and de Witt, Wallace, Jr., and Colton, G. W.). What are possible stratigraphic controls for gas fields in eastern black shale?: Oil and Gas Journal, v. 76, no. 14, p. 162-165, illus., **1978.** General discussion of the Devonian black shales in the eastern part of the Appalachian basin and their potential for economic development.

See also Harris, Anita G., 1; Milici, Robert C., 1.

HARRISON, SAMUEL S.

1. Turbidite origin of glaciolacustrine sediments, Woodcock Lake, Pennsylvania: Journal of Sedimentary Petrology, v. 45, no. 3, p. 738-744, illus., **1975.** The turbidity currents that deposited the silt and clay sediments probably originated from an outwash stream which flowed into an ice-dammed lake in Woodcock Creek valley during Pleistocene time.
2. (and Topp, L. M.). False "bedrock" in glacial drift: Association of Engineering Geologists Bulletin, v. 12, no. 4, p. 323-325, illus., **1975.** "Out-of-place" layers of sedimentary rock buried within drift deposits can easily be mistaken for bedrock.

See also Cox, J. C., 1.

HARTER, ROBERT D.

1. Adsorption of copper and lead by Ap and B2 horizons of several northeastern United States soils: Soil Science Society of America Journal, v. 43, no. 4, p. 679-683, illus., **1979.** The best predictor of adsorption of copper and lead by soils was by sum of bases. Hagerstown and Gilpin soils from Pennsylvania were two of 15 soils studied.

HARTMAN, RONALD R., *see* Curtis, C. E., 1.

HARTWELL, J. W., *see* Irani, M. C., 1.

HARVEY, ARNOLD H.

1. Pennsylvania, *in* Mining and mineral operations in the New England and Mid-Atlantic states—A visitor guide: U.S. Bureau of Mines, p. 48-57, illus., **1976.** Accessible mines and historical sites related to mining and petroleum extraction are described. A location map is included.

See also Dierks, Henry A., 1.

HASSON, KENNETH O.

1. Stratigraphy and structure of the Harrell Shale and part of the Mahantango Formation between Bedford, Pennsylvania and Scherr, West Virginia, *in* Dennison, J. M., ed., Stratigraphy, sedimentology, and structure of Silurian and Devonian

rocks along the Allegheny Front in Bedford County, Pennsylvania, Allegany County, Maryland, and Mineral and Grant Counties, West Virginia: Annual Field Conference of Pennsylvania Geologists, 37th, Bedford, Pa., Guidebook, p. 81–89, illus., **1972.** The regional stratigraphy is summarized.

2. (and Dennison, J. M.). Eustatic sea level rise over Fulton lobe of Catskill delta in Pennsylvania during Middle-Upper Devonian transition [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 175–176, **1973.**
3. (and Dennison, J. M.). The Pokejoy Member, a new subdivision of the Mahantango Formation (Middle Devonian) in West Virginia, Maryland, and Pennsylvania: West Virginia Academy of Science Proceedings, v. 46, no. 1, p. 78–86, **1974.** The authors formally name the Pokejoy Member. Descriptions of type and reference sections, a discussion of lithologic variations within the member, and the delineation of its areal distribution are included. The type locality is at Pokejoy Run, Mineral County, West Virginia. Exposures of the Pokejoy Member in Pennsylvania are in Blair, Bedford, and Huntingdon Counties.
4. (and Dennison, J. M.). Devonian Harrell and Millboro Shales in parts of Pennsylvania, Maryland, West Virginia and Virginia, *in* Schott, G. L., and others, eds., Preprints—First Eastern Gas Shales Symposium [Morgantown, W. Va., 1977]: U.S. Energy Research and Development Administration, p. 476–483, illus., **1977;** *in* Schott, G. L., and others, eds., Proceedings, First Eastern Gas Shales Symposium: U.S. Energy Research and Development Administration Report MERC/SP-77/5, p. 634–637, illus., **1977.** Stratigraphy is summarized.
5. Stratigraphic distribution of Devonian Harrell Shale fauna [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 417, **1978.**
6. (and Dennison, J. M.). Stratigraphy of the Devonian Harrell and Millboro Shales in parts of Pennsylvania, Maryland, West Virginia, and Virginia: U.S. Department of Energy Open-File Report DOE EGSP 110, 124 p., illus., **1978** [not seen].
7. (and Dennison, J. M.). Devonian shale stratigraphy between Perry Bay and the Fulton lobe, south-central Pennsylvania and Maryland, *in* Dennison, J. M., and others, Devonian shales in south-central Pennsylvania and Maryland: Annual Field Conference of Pennsylvania Geologists, 44th, Bedford, Pa., Guidebook, p. 1–17, illus., **1979.** Outcrop stratigraphic relationships, depositional environments, and nomenclatural changes of the Brallier Formation, Harrell and Burket Shales, Tully Limestone, and Mahantango Formation are examined as the depositional environment of these rocks in south-central Pennsylvania changes from open marine to deltaic. The stratigraphy of the Needmore Shale and its relationship to the Huntersville Chert are also discussed.

See also Dennison, John M., 6, 10, 13.

HASTINGS, DAVID S.

1. (and Conkwright, R. D., and Boettcher, A. J.). Geology of the Quarryville-Mine Ridge area [Lancaster County]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

HATCH, JAMES W., *see* Webster, David, 1.

HAUER, PETER M.

1. Pennsylvania's only saltpetre cave: a background study [abs.]: National Speleological Society Bulletin, v. 33, p. 152–153, **1976.**

HAY, RONALD A., *see* Webster, David, 1.

HAZEN, KATHLEEN, *see* Gomez, Manuel, 1.

HEA, J. P.

1. Exploration concepts in deformed belt of Appalachians [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1892–1893, **1974.**

HEAD, JAMES W.

1. Upper Silurian-Lower Devonian stratigraphy and nomenclature in the central Appalachians, *in* Dennison, J. M., ed., Stratigraphy, sedimentology, and structure of Silurian and Devonian rocks along the Allegheny Front in Bedford County, Pennsylvania, Allegany County, Maryland, and Mineral and Grant Counties, West Virginia: Annual Field Conference of Pennsylvania Geologists, 37th, Bedford, Pa., Guidebook, p. 96–103, illus., **1972.** The paleogeography, lithofacies, biofacies, and stratigraphic nomenclature of the Late Silurian-Early Devonian biogenic carbonate sediments of New York, Pennsylvania, Maryland, and Virginia are discussed.
2. Correlation and paleogeography of upper part of Helderberg Group (Lower Devonian) of central Appalachians: American Association of Petroleum Geologists Bulletin, v. 58, no. 2, p. 247–259, illus., **1974.** A combination of lithostratigraphic, biostratigraphic, and paleogeographic evidence indicates that there is a time correlation between the Shriver Chert and the Little Cove and Cherry Run Members of the Licking Creek Limestone, and also that these rocks were deposited in a marginal to offshore basin environment.

See also Dennison, John M., 7.

HEALD, M. T.

1. (and Larese, R. E., and Patchen, D. G.). Diagenesis in sandstone reservoirs of Appalachian basin [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1893, **1974.**

HEALD, WALTER R.

1. (and Rogowski, A. S.). Soil water and chemical movement in a sloping fragipan system, *in* Correll, D. L., ed., Watershed research in eastern North America—A workshop to compare results: Smithsonian Institution, Chesapeake Bay Center for Environmental Studies, Edgewater, Md., v. 1, p. 385–399, illus., **1977.** Chemical analyses of soil-water samples were used to complement hydrologic findings in the Mahantango Creek watershed area.

See also Gburek, William J., 1.

HECK, E. T.

1. Fossil fluids in post-Silurian rocks of Appalachian basin [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 5, p. 845, **1979.**

HECKEL, PHILIP H.

1. Nature, origin, and significance of the Tully Limestone: Geological Society of America Special Paper 138, 244 p., illus., **1973.** The facies and depositional history of the Tully Limestone in New York are discussed in detail; the Tully in northwestern Pennsylvania is also discussed.

HEERDEGEN, RICHARD G.

1. (and Reich, B. M.). Unit hydrographs for catchments of different sizes and dissimilar regions: Journal of Hydrology, v. 22, no. 1–2, p. 143–153, illus., **1974** [not seen].

HEEREN, LILLIAN A., *see* Kelley, Dana R., 8.

HEFFNER, J. D.

1. Harrisburg 1° x 2° NTMS area, Pennsylvania—Data release, National Uranium Resource Evaluation Program—Hydrogeochemical and stream sediment reconnaissance: U.S. Department of Energy Report DPST-79-146-1, 50 p., **1979** [not seen].
2. Williamsport 1° x 2° NTMS area, Pennsylvania—Data report—Hydrogeochemical and stream sediment reconnaissance: U.S. Department of Energy Report DPST-79-146-8 (GJBX-152-79), 46 p., illus., **1979** [not seen].

HEIM, JACK D., *see* Duvel, William A., Jr., 1.

HEINZ, JOHN

1. The case for anthracite: Environment, v. 21, no. 1, p. 2-4, illus., **1979.** Six northeastern Pennsylvania counties are dependent on the anthracite industry for economic survival. The economic impact of current laws on the industry is reviewed.

HELM, ROBERT E.

1. Sediment discharge from highway construction near Port Carbon, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 78-35, 27 p., illus., **1978.** Construction during relocation of 4.3 miles of roadway in Schuylkill County caused 50 percent of the sediment yield during a two-year study period. Seventy percent of the total sediment load resulted from eight storms during 4 percent of the time period.

HENDERSON, B. K., *see* Ferm, John C., 9.

HENNEN, GARY J., *see* Gillespie, William H., 1.

HENNIGER, B. R., *see* Martin, Wayne D., 1.

HENNINGER, D. L.

1. (and Petersen, G. W., and Engman, E. T.). Surface soil moisture within a watershed—variations, factors influencing, and relationship to surface runoff: Soil Science Society of America Journal, v. 40, no. 5, p. 773-776, illus., **1976.** Research in the Mahantango Creek basin indicates that surface soil moisture is responsive to storm events, has seasonal trends, and has higher fluctuation at higher moisture levels.

HENSLEY-DUNN, MARGARET L., *see* Speer, J. Alexander, 3.

HERBSTRITT, JAMES T.

1. (and Love, D. A.). Archaeological investigations of Split Rockshelter, 36EL4, Horton Township, Elk County, Pennsylvania: Pennsylvania Archaeologist, v. 45, no. 4, p. 22-44, illus., **1975.** This site is located at the western end of an outcrop of Olean Conglomerate sandstone (Mississippian). A Late Prehistoric occupation has been recognized at the shelter.

HERRE, BERNARD H., *see* Villaume, James F., 2.

HERRICK, DAVID C.

1. (and Rose, A. W., and Deines, Peter). Mineralogical and isotopic studies of the Cornwall iron deposit, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 7, p. 534-535, **1972.**

2. An isotopic study of the magnetite-chalcopyrite deposit at Cornwall, Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, 1973; [abs.], Dissertation Abstracts International, v. 34, no. 8, p. 3841B, 1974.

See also Smith, Robert C., II, 3.

HERTING, DAVID A.

1. (and Wright, T. O.). Geochemistry and tectonic implications of the Jonestown volcanic rocks: Pennsylvania Academy of Science Proceedings, v. 51, no. 2, p. 150–152, illus., 1977. The presence of oceanic rocks within the Hamburg klippe near Jonestown indicates that this area was possibly a back-arc marginal basin containing a minor spreading center during Middle Ordovician time.

HESS, EUGENE D.

1. Status of the water well inventory: Pennsylvania Geology, v. 9, no. 6, p. 9–10, 1978. The computer data-base system for water well records is announced.

See also Inners, Jon D., 4.

HESS, PAUL W., *see* Foose, Richard M., 2.

HESTER, JAMES S.

1. Fluid inclusions in stratiform, carbonate terrane, ore related minerals, and as a possible tool in prospecting: Lancaster, Pa., Franklin and Marshall College, Senior thesis, 1974.

HETRICK, STEVEN W.

1. (and Gooch, J. L.). Genetic variation in populations of the freshwater amphipod *Gammarus minus* in the central Appalachians [abs.]: National Speleological Society Bulletin, v. 35, no. 1, p. 17, 1973.

HEYL, ALLEN V.

1. (and Bozion, C. N.). Some little known types of massive sulfide deposits in the Appalachian region, U.S.A.: Soc. Mining Geol. Japan, v. 3, p. 52–59, 1971 [not seen].
2. (and Foord, E. E., and Heyl, M. L.). Chromian dravite, a new variety of tourmaline from the Line pit (Lows mine) in Pennsylvania and Maryland: Friends of Mineralogy, Pennsylvania Chapter, Newsletter, p. 3–5, Fall 1977. Pale-bluish-green through emerald-green to deep-blackish-green tourmaline has been found at the Line pit, on the Pennsylvania-Maryland border northeast of Rock Springs, Maryland. This is the first reported occurrence of chromian dravite from Pennsylvania.
3. [Native bismuth from Pennsylvania]: Friends of Mineralogy, Pennsylvania Chapter, Newsletter, v. 7, no. 3–4, p. 6–7, 1979. Bismuth has been verified in a specimen, probably from pegmatite in the Octoraro phyllite at Pennington, Chester County.

HEYL, M. L., *see* Heyl, Allen V., 2.

HEYMAN, LOUIS

1. Coal, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 108–111, 1970. A brief description of the economically important coals in Allegheny County. Some resource estimates are included.
2. History of Pittsburgh's rivers, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report

59, p. 84–92, illus., **1970.** The Appalachian Plateau of western Pennsylvania is drained by two major river systems, the Susquehanna in the east and the Ohio in the west. The history of the rivers since the Cenozoic Era is described. River terraces and channels are discussed.

3. Introduction [to chapter on economic geology], *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 105–108, **1970.** A review of commercially valuable minerals, including background information on the development of the coal industry.
4. Sand and gravel, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 122–123, **1970.** A brief description of economically important sand and gravel deposits in Allegheny County. Both river dredging and old high-level river terrace mining were being done at the time of writing.
5. Sandstone and limestone, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 123–126, illus., **1970.** The economically important characteristics of sandstones and limestones found in Allegheny County and the bordering counties to the north are discussed. Sites of some active mining operations are given.
6. Surface and ground water, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 119–122, **1970.** Water-supply sources in Allegheny County are discussed. The most important sources are the alluvial deposits filling most stream valleys.
7. (and Edgerton, C. D.). Clay and shale, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 126–127, **1970.** Economic geology of clay and shale found in the Pittsburgh area is discussed. In Allegheny County these mineral products rank low in economic importance. Almost the entire output of these raw materials goes into building and face brick.
8. Gas discovery in Armstrong County: Pennsylvania Geology, v. 2, no. 1, p. 16, **1971.** A wildcat gas discovery from the Lower Devonian Oriskany Sandstone was made in a previously unproductive area.
9. Tully (Middle Devonian) to Queenston (Upper Ordovician) correlations in subsurface of western Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1893, **1974.**
10. Subsurface rock correlation diagram, Allegheny Plateau of Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Pennsylvania in 1976: Pennsylvania Geological Survey, 4th ser., Progress Report 190, p. 29–32, illus., **1977.** A summary of the regional rock stratigraphy from the Middle Devonian to basement.
11. Tully (Middle Devonian) to Queenston (Upper Ordovician) correlations in the subsurface of western Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 73, 16 p., 3 pls., **1977.** The subsurface stratigraphy of western Pennsylvania was refined and interpreted to resolve some of the stratigraphic complexities.
12. (and Craft, J. L.). Landslides, in Freedman, J. L., ed., "Lots" of danger—Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, p. 59–71, illus., **1977.** The term "landslide" is defined and the causes and prevention measures outlined.
13. (and Cozart, C. L.). Oil and gas developments in Pennsylvania in 1977: Pennsylvania Geological Survey, 4th ser., Progress Report 191, 39 p., illus., **1978.**
14. (and Cozart, C. L.). Pennsylvania, *in* Patchen, D. G., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in

1977]: American Association of Petroleum Geologists Bulletin, v. 62, no. 8, p. 1400–1402, 1414–1422, 1435, illus., **1978.**

See also Cate, Addison S., 1; Craft, Jesse L., 7; Edmunds, William E., 10; Kelley, Dana R., 3, 4; Lytle, William S., 6, 7, 10, 27; Piotrowski, Robert G., 13; Wagner, Walter R., 6, 9, 10.

HEYN, C.

1. (and Wescott, W.). Geology of the Conestoga-Marticville area, Lancaster County, Pa.: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1972.**

HIDALGO, ROBERT V., *see* Streib, Donald L., 1, 2, 3.

HIEMSTRA, L. A. V., *see* Sopper, William E., 1.

HIGGINS, MICHAEL W.

1. Evidence for the Peach Bottom anticline, southeastern Pennsylvania and northeastern Maryland [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 5, p. 321, **1971.**
2. Age, origin, regional relations, and nomenclature of the Glenarm Series, central Appalachian Piedmont: a reinterpretation: Geological Society of America Bulletin, v. 83, no. 4, p. 989–1026, illus., **1972.** The most important steps are traced in the interpretation of the Glenarm Series. A revised nomenclature is proposed and alternate interpretations are given for some of the granitic rocks. The Wissahickon Formation in southeastern Pennsylvania is included.
3. (and Fisher, G. W., and Zietz, Isidore). Aeromagnetic discovery of a Baltimore Gneiss dome in the Piedmont of northwestern Delaware and southeastern Pennsylvania: Geology, v. 1, no. 1, p. 41–43, illus., **1973.** Aeromagnetic data and field work indicate that a previously unknown Baltimore Gneiss dome, called the Mill Creek dome, is present in southeastern Pennsylvania and northwestern Delaware.
4. Reply, *in* Age, origin, regional relations, and nomenclature of the Glenarm Series, central Appalachian Piedmont: a reinterpretation: discussion and reply: Geological Society of America Bulletin, v. 87, no. 10, p. 1523–1528, illus., **1976.**
5. The Baltimore Complex, Maryland and Pennsylvania, *in* Sohl, N. F., and Wright, W. B., Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1976: U.S. Geological Survey Bulletin 1435-A, p. A127–A128, A129, illus., **1977.** The group of rocks formerly called Baltimore gabbro are now named Baltimore Complex. The name was adopted to reflect the diverse petrographic nature of the metamorphosed mafic and ultramafic rocks in the mass and also their complex arrangement.
6. (and Sinha, A. K., Zartman, R. E., and Kirk, W. S.). U-Pb zircon dates from the central Appalachian Piedmont: a possible case of inherited radiogenic lead: Geological Society of America Bulletin, v. 88, no. 1, p. 125–132, illus., **1977.** The controversial age problem of the Glenarm Series is discussed. Zircon dates may not be precise because of inherited older radiogenic lead and also because of lead and uranium loss during metamorphism.

See also Fisher, George W., 2.

HIGH, SAMUEL A.

1. Geology of the north flank of Mine Ridge [Lancaster County]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1974.**

HILL, RODERICK J., *see* Speer, J. Alexander, 5.

HINCE, CHRISTINE M.

1. Effects of geology and land use on ground water and stream water in the Hammer Creek drainage basin [Lancaster and Lebanon Counties]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

HINDS, ROBERT W.

1. (and Ward, A. N., Jr.). Lower Tuscarora (Silurian) marine faunal assemblage from central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 38, **1974.**

HIPWELL, RICHARD M., *see* Khoury, S. G., 1.

HOAGLAND, ALAN D.

1. Appalachian strata-bound deposits: their essential features, genesis and the exploration problem: Economic Geology, v. 66, no. 5, p. 805–810, **1971.** Appalachian-type zinc deposits were formed in nearly horizontal strata and were folded and faulted by the Appalachian orogen. The zinc deposits at Friedensville, Lehigh County, are cited as a classic example.
2. Appalachian zinc-lead deposits, *in* Wolf, K. H., ed., Handbook of strata-bound and stratiform ore deposits—II, Regional studies and specific deposits—Volume 6, Cu, Zn, Pb, and Ag deposits: Amsterdam, Elsevier Scientific Publishing Company, p. 495–534, illus., **1976.** Evidence for the formation of ore bodies is reevaluated. The Friedensville, Lehigh County, zinc deposit is included in the discussion.

HOARE, R. D.

1. (and Sturgeon, M. T.). Chonetoid brachiopod zonation of the Pennsylvanian of the Appalachian basin [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 90, **1979.**

HOBBA, W. A., JR.

1. (and Fisher, D. W., Pearson, F. J., Jr., and Chemerys, J. C.). Hydrology and geochemistry of thermal springs of the Appalachians: U.S. Geological Survey Professional Paper 1044-E, p. E1–E36, illus., **1979.** A study of the geologic and hydrologic setting and the physical and chemical character of selected major warm springs of the Appalachians. A silica rock spring in Perry County is discussed.

HOERING, THOMAS C.

1. The olefins in Bradford, Pennsylvania crude oil [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 7, p. 541, **1972.**
2. Olefinic hydrocarbons from Bradford, Pennsylvania, crude oil: Chemical Geology, v. 20, no. 1, p. 1–8, illus., **1977.** Evaluation of oil from the Bradford field showed a distillation fraction of 2 percent olefinic hydrocarbons. The observed molecular structures can be accounted for by a process of natural thermal cracking of saturated hydrocarbons followed by a rapid disappearance of *cis* and terminal olefins.

HOFF, DONALD T.

1. Campbell's quarry—A complex mineral locality in Gettysburg, Pennsylvania: Rocks and Minerals, v. 53, no. 6, p. 247–253, illus., **1978.** This quarry in metamor-

phosed shale of the Triassic Gettysburg Formation is a noted zeolite-suite collecting locality. A list of minerals is included.

See also Sevon, William D., 16; Smith, Robert C., II, 22.

HOFMANN, A. W.

1. (and Mahoney, J. W., Jr., and Giletti, B. J.). K-Ar and Rb-Sr data on detrital and postdepositional history of Pennsylvanian clay from Ohio and Pennsylvania: Geological Society of America Bulletin, v. 85, no. 4, p. 639–644, illus., **1974.** K-Ar and Rb-Sr measurements on whole rocks and on separated size fractions of Pennsylvanian underclays were made in an attempt to relate the apparent ages to the degree of metamorphism.

HOHOS, E. F., *see* Ferm, John C., 7.

HOLBROOK, PHILIP W.

1. The sedimentology and pedology of the Mauch Chunk Formation at Pottsville, Pennsylvania and their climatic implications: Lancaster, Pa., Franklin and Marshall College, M.S. thesis, **1970.**
2. Geologic and mineralogic factors controlling the properties and occurrence of ladle brick clays: University Park, Pennsylvania State University, Ph.D. thesis, **1973;** [abs.], Dissertation Abstracts International, v. 35, no. 3, p. 1298B, **1974.**
3. (and Williams, E. G.). Geologic and mineralogic factors controlling the properties and occurrence of ladle brick clays: Pennsylvania State University, College of Earth and Mineral Sciences Special Publication 1–73, 89 p., illus., **1973.** The mineralogy of the Lower Kittanning underclay was studied for the area of western Pennsylvania. The genesis of the underclay was interpreted and used to predict favorable locations.
4. Evidence for weathering in the Lower Kittanning underclay, western Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 90–91, **1979.**

See also Williams, Eugene G., 4.

HOLBROOK, R. R., *see* Williams, Eugene G., 6.

HOLEYWELL, ROGER C.

1. (and Tullis, T. E.). Mineral reorientation and slaty cleavage in the Martinsburg Formation, Lehigh Gap, Pennsylvania: Geological Society of America Bulletin, v. 86, no. 9, p. 1296–1304, illus., **1975.** The results of field, thin-section, and X-ray investigations of preferred orientation are presented for an outcrop of the Martinsburg Formation near Palmerton, Carbon County, Pennsylvania.

HOLLIS, STEPHEN H.

1. Geology of the Bunker Hills and vicinity, Lebanon County, Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Master's thesis, **1974.**

HOLLOD, GREGORY J., *see* McDuffie, Bruce, 1.

HOLLOWELL, JERRALD R.

1. Hydrology, glacial geology and environmental geology of the Wyoming-Lackawanna Valley, *in* Krajewski, S. A., and others, Upper Devonian sedimentation in Susquehanna County *and* Hydrology, glacial geology and environmental geology of the Wyoming-Lackawanna Valley: Annual Field Conference of Pennsylvania Geologists, 36th, Wilkes-Barre, Pa., Guidebook, p. 77–103, illus., **1971.** Discussion of the environmental problems resulting from the removal of

coal, and characteristics of Pleistocene deposits of the area. Six stops, covering 75 miles, included visits to mine fires and to Archbald Pothole State Park.

2. Hydrology of the Pleistocene sediments in the Wyoming Valley, Luzerne County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 28, 77 p., illus. including geologic map, **1971.** Beneath the glacial deposits of the Wyoming Valley are the vast coal beds of the Northern Anthracite field. Many of the coal beds are filled with water; this report provides information on water locations and groundwater conditions affecting building, construction, and excavation.
3. Ground-water conditions caused by tropical storm Agnes: Pennsylvania Geology, v. 5, no. 2, p. 2–9, illus., **1974.** Changes in groundwater levels due to precipitation associated with tropical storm Agnes are reported.
4. Hydrology of the abandoned coal mines in the Wyoming Valley, Pa.: U.S. Geological Survey Open-File Report 74–237, 47 p., illus., **1974** [not seen].
5. Results of initial sampling of heavy metals & pesticides found in stream bottom sediments in the Susquehanna River basin: Susquehanna River Basin Commission, 12 p., illus., **1975.**
6. (and Koester, H. E.). Ground-water resources of Lackawanna County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 41, 106 p., illus. including geologic map, **1975.** A detailed inventory and evaluation of the groundwater resources, including a description of the distribution and movement of water in the underground mines and the effect that mine-water discharge has on the Lackawanna River.
7. The role of interstate commissions in ground-water protection: the Susquehanna River Basin Commission perspective, *in* Kerns, W. R., ed., Public policy on ground water quality protection: Blacksburg, Va., Virginia Polytechnic Institute and State University, p. 124–129, **1977;** Water & Sewage Works, v. 124, no. 9, p. 102, 105, **1977** [not seen].

See also Krajewski, Stephen A., 3.

HOLSINGER, JOHN R.

1. The cave fauna of Pennsylvania, *in* White, W. B., ed., Geology and biology of Pennsylvania caves: Pennsylvania Geological Survey, 4th ser., General Geology Report 66, p. 72–87, **1976.** The ecological classification of cavernicoles is used to define troglobites, troglophiles, trogloxenes, and accidentals. Fifteen caves are included in the discussion.

HOOKER, MARJORIE

1. "Catoctin schist" analysis—its true identity: U.S. Geological Survey Professional Paper 700-D, p. D106–D107, **1970.** An analysis erroneously reported by Stose and Stose (1946, Maryland Department of Geology, Mines, and Water Resources, Carroll and Frederick Counties Report, p. 11–131) as being that of a schist from South Mountain, Pennsylvania, is actually that of a basalt from California.

HOOVER, DAVID S.

1. (and Davis, Alan). The role of automated reflectance microscopy in coal petrographic characterization [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 91–92, **1979.**

HOOVER, KARL V.

1. (ed.). Proceedings, Fifth Forum on Geology of Industrial Minerals [Harrisburg, Pa., 1969]: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report

64, 278 p., illus., **1970.** The 14 papers and discussions included emphasize the role of science and technology in solving the problems faced in providing an adequate supply of industrial minerals.

2. Directory of the mineral industry in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 54, 2nd ed., 132 p., illus., **1971.** Replaced by the third edition in 1977 (see O'Neill, B. J., Jr., 7).
3. (and Saylor, T. E., Lapham, D. M., and Tyrell, M. E.). Properties and uses of Pennsylvania shales and clays, southeastern Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 63, 329 p., illus., **1971.** Argillaceous rock samples and unconsolidated material from 159 locations in southeastern Pennsylvania were evaluated for 100 ceramic and nonceramic uses. The evaluation indicated 108 potential areas where material may be obtained for ceramic-ware products or lightweight aggregate.
4. Anthracite coal region, northeastern Pennsylvania, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 229–269, illus., **1978.** The field trip provided insight into the geologic problems related to the mining of anthracite coal.

See also Lapham, Davis M., 10.

HOQUE, MOMINUL

1. Paleocurrent and paleoslope; a case study: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 17, no. 1, p. 77–85, illus., **1975.** The relationship between the paleocurrent pattern and the paleoslope in several continental and marine environments is reviewed. The study shows that the sediment dispersal system and the pattern of currents are independent of the paleoslope, and that the vector orientation is polymodal.

HORNE, JOHN C.

1. (and Ferm, J. C., Caruccio, F. T., and Baganz, B. P.). Depositional models in coal exploration and mine planning in Appalachian region: American Association of Petroleum Geologists Bulletin, v. 62, no. 12, p. 2379–2411, illus., **1978.** The manner in which the depositional environment influenced the thickness, extent, quality, and potential minability of coal seams, and how the tectonic setting modified these factors, is shown. The study area includes southwestern Pennsylvania.

See also Ferm, John C., 6.

HORNE, MARY E.

1. Planning a better York by using geology: Pennsylvania Geology, v. 2, no. 2, p. 10–12, illus., **1971.** Summary of a study done to determine the importance of the area's resources for present and future needs.
2. Planning a better York by using geology, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 176–178, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 176–178, illus., **1971.** A description of the environmental geology study of central York County being conducted by the Pennsylvania Geological Survey.
3. Environmental geology in York, Pennsylvania and the surrounding region: University Park, Pennsylvania State University, M.S. paper, **1973.**
4. Geology for land-use planning in York County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 179–180, **1973.**

HOROWITZ, ALAN S.

1. (and Rexroad, C. B.). Conodont biostratigraphy of some United States Mississippian sites: Journal of Paleontology, v. 46, no. 6, p. 884–891, illus., **1972.** Conodonts from the Wymps Gap limestone in Fayette County are late Mississippian (Chesterian) in age. Conodonts have also been collected from Mississippian units in other states.

HOROWITZ, DANIEL H.

1. Diagenetic significance of color boundary between Juniata and Bald Eagle Formations, Pennsylvania: Journal of Sedimentary Petrology, v. 41, no. 4, p. 1134–1136, illus., **1971.** Reducing solutions forced upwards from the marine Reedsville into overlying continental beds during compaction caused color changes and formation of ankerite with little regard for lithofacies, but preference for permeable sandstones.

HORTON, R. E.

1. Erosional development of streams—quantitative physiographic factors, *in* Dury, G. H., ed., Rivers and river terraces: London, MacMillan and Company, p. 117–165, illus., **1970** (condensed edition; originally published 1945). The problem of erosional morphology was approached quantitatively using a system of stream orders. Physiographic factors for drainage basins and the relationship of geologic structure to drainage composition are discussed and illustrated by creeks in southeastern Pennsylvania.

HOSKINS, DONALD M.

1. Fifty years of the Fourth Survey: Pennsylvania Geology, v. 1, no. 2, p. 8–9, illus., **1969.** Historical sketch of the Survey from 1919 to 1969.
2. Alternative interpretation of the Catskill-Pocono contact in the anthracite area of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 25, **1970.**
3. The Silurian Williamsport Sandstone from southern Bedford County, Pennsylvania, to Keyser, West Virginia, *in* Dennison, J. M., ed., Stratigraphy, sedimentology, and structure of Silurian and Devonian rocks along the Allegheny Front in Bedford County, Pennsylvania, Allegany County, Maryland, and Mineral and Grant Counties, West Virginia: Annual Field Conference of Pennsylvania Geologists, 37th, Bedford, Pa., Guidebook, p. 104–106, **1972.** The Williamsport Sandstone is the nonred lateral equivalent of the Moyer Ridge Member of the Bloomsburg Formation of central Pennsylvania. A section is included for an exposure south of Centerville.
4. Appendix to Stop X: Upper Silurian and Lower Devonian stratigraphy in the Juniata-Susquehanna Valleys, *in* Faill, R. T., ed., Structure and Silurian-Devonian stratigraphy of the Valley and Ridge province, central Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 38th, Camp Hill, Pa., Guidebook, p. 150–154, illus., **1973.** Proposed changes in the stratigraphy of the area are presented.
5. Field trip to a faulted syncline: Pennsylvania Geology, v. 5, no. 6, p. 13–16, illus., **1974.** An excellent geologic exposure occurs at exit 39 of Interstate Route 81 at Spring Mountain. Three major geologic features can be observed: a complete syncline, faults disrupting the syncline, and the contact of the Pottsville and Mauch Chunk Formations.
6. New fossil collecting locality in Lycoming County: Pennsylvania Geology, v. 5, no. 5, p. 11–12, illus., **1974.** The description and location of a new fossil-collecting locality in the Brallier Formation (Upper Devonian) east of Hughesville. Many

different types of fossils (brachiopods, crinoid columnals, plant fragments, bryozoans, coral, pelecypod, cephalopod, and gastropod) were found here.

7. Geology and mineral resources of the Millersburg 15-minute quadrangle, Dauphin, Juniata, Northumberland, Perry, and Snyder Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 146, 38 p., illus. including geologic map, **1976.** Provides detailed information on the nature and distribution of the rock units, the mineral resources, and the groundwater resources.
8. Triassic-Jurassic diabase extended: Pennsylvania Geology, v. 7, no. 3, p. 6–8, illus., **1976.** New mapping revealed that a Triassic-Jurassic diabase dike that traverses central Pennsylvania extends about 15 miles further north than previously known.
9. (and Sevon, W. D.). New Illinoian till (?) locality and river terraces in the Millersburg area, Susquehanna River valley, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 200, **1976.**
10. (and Root, S. I.). Major cross structures in Pennsylvania (part II): Pennsylvania Geology, v. 8, no. 3, p. 4–7, illus., **1977.** The Sideling Hill, Breezewood, and Bedford faults (Fulton and Bedford Counties) are discussed.
11. Gifford Pinchot State Park—Diabase (molten liquid rock): Pennsylvania Geological Survey, 4th ser., Park Guide 10, pamphlet, illus. **[1978].** The geology is illustrated through a map, a sketch, and photographs. Locations where diabase, the predominant rock type, can be examined are indicated.
12. Sequential faulting during Alleghanian orogenesis, Seven Mountains, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 16, **1979.**

See also Dennison, John M., 13; Faill, Rodger T., 10, 17; Root, Samuel I., 10, 11, 12.

HOSTERMAN, JOHN W.

1. (and Wood, G. H., Jr., and Bergin, M. J.). Mineralogy of underclays in the Pennsylvania Anthracite region, *in* Geological Survey Research 1970, Chapter C: U.S. Geological Survey Professional Paper 700-C, p. C89–C97, illus., **1970.** The underclays of anthracite beds in eastern Pennsylvania contain kaolinite, illite, chlorite, pyrophyllite, and phlogopite. The association of these clay minerals indicates that the anthracite formed in the greenschist range of temperatures and pressures; that is, between 250 and 450 °C and 2,000 to 9,000 bars, respectively.
2. Underclay deposits of Somerset and eastern Fayette Counties, Pennsylvania: U.S. Geological Survey Bulletin 1363, 17 p., illus., **1972.** A geological, mineralogical, and chemical study of underclay beds in the Allegheny Group of southwestern Pennsylvania.
3. White clay deposits of Centre, Blair, Huntingdon, and Bedford Counties, Pennsylvania, *in* Geological Survey research 1972, Chapter B: U.S. Geological Survey Professional Paper 800-B, p. B57–B65, illus., **1972.** The mineralogy, geologic setting, and origin of clay deposits in central Pennsylvania are reviewed. All of the deposits discussed are from the Gatesburg Formation (Cambrian) or the Oriskany Group (Devonian).
4. (and Loferski, P. J.). Preliminary report on the clay mineralogy of the Upper Devonian shales in the southern and middle Appalachian basin: U.S. Geological Survey Open-File Report 78–1084, 27 p., illus., **1978** [not seen].

HOWE, R. H., *see* Reidenouer, David R., 1.

HOWE, STEPHEN S.

1. (and Ohmoto, Hiroshi, and Rose, A. W.). Sulfur isotopes of lead-zinc occurrences in central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 16–17, **1979.**

HOWELL, BENJAMIN F., JR.

1. Earthquake hazard in the eastern United States: Earth and Mineral Sciences, v. 42, no. 6, p. 41–45, illus., **1973.** How earthquakes are rated, the seismic hazard index, and preparation for earthquakes, as they affect the eastern United States, are discussed.
2. Earthquake expectancy in Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 53, no. 2, p. 205–208, illus., **1979.** The largest earthquake in each of the last 50 years in Pennsylvania can be used to predict the probability of an earthquake of any size occurring in any year. Estimates of the largest expectable earthquakes per 100 and per 1,000 years are given for 13 locations.
3. Earthquake recurrence expectation for the contiguous United States [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 18, p. 312, **1979.**
4. Earthquake risk in eastern Pennsylvania: Earth and Mineral Sciences, v. 48, no. 8, p. 57, 63–64, illus., **1979.** Pennsylvania is one of the safest states in terms of earthquake risk. Causes and the probability of occurrence of earthquakes are discussed. A list of Pennsylvania earthquakes dating from 1728 is included.
5. Earthquake risk in eastern Pennsylvania: Earthquake Engineering Research Institute Newsletter, v. 13, no. 4, p. 130–137, **1979** [not seen].
6. On the probability of recurrence of very large earthquakes: International Association of Seismicity and Physics of the Earth, XIII Geological Association, Program, p. 27, **1979** [not seen].
7. The largest possible earthquake [abs.]: Earthquake Notes, v. 50, p. 23–24, **1979.**

HOWER, JAMES C.

1. The paleomagnetism and structure of the Ordovician igneous rocks of Lebanon County, Pennsylvania: Columbus, Ohio State University, M.S. thesis, **1975.**
2. Anisotropy of vitrinite reflectance in relation to coal metamorphism for selected United States coals: University Park, Pennsylvania State University, Ph.D. thesis, **1978;** [abs.], Dissertation Abstracts International, v. 39, no. 10, p. 4780B, **1979.**
3. (and Davis, Alan). Optical anisotropy of vitrinite reflectance and coal metamorphism: western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 425, **1978.**
4. A Lower Ordovician geomagnetic pole from Pennsylvania: Earth and Planetary Science Letters, v. 44, no. 1, p. 65–72, illus., **1979.** Diabase, basalt, and arkose were sampled from the Middle Ordovician Martinsburg Formation in Lebanon County, and a geomagnetic pole reading was obtained. The procedure used is summarized.
5. (and Paxton, S. T.). Concomitant coal metamorphism—sandstone textural modifications in the Pennsylvanian of the North-Central fields, Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 93, **1979.**

HOZIK, MICHAEL

1. The origin of limonite pseudomorphs at Chestnut Hill, Lancaster County, Pennsylvania: Carlisle, Pa., Dickinson College, Senior thesis, **1970.**

HRB-SINGER, INC.

1. Detection of abandoned underground coal mines by geophysical methods: U.S. Environmental Protection Agency Water Pollution Control Research Series 14010 EHN, 94 p., illus., **1971.** The location and extent of mine voids in relatively flat lying bituminous coal beds are determined by using the following geophysical methods: electrical resistivity, self potential, infrared radiometry, total field and differential magnetometry, seismic refraction and reflection, and very low frequency electromagnetic and induced polarization. Eight mines, located in Rush

Township, Centre County, and near the town of Westport, Clinton County, were selected.

HSU, FU-TZU

1. Geochemical exploration in the Nittany Valley area, Centre County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1973.**
2. (and Rose, A. W.). Exploration in the Nittany Valley area, Centre County, Pa., using stream sediment and water geochemistry [abs.]: Mining Engineering, v. 25, no. 8, p. 32, **1973.**

HULL, LAURENCE C.

1. Selected aspects of the hydrogeology of Woodcock Reservoir [Crawford County]: Meadville, Pa., Allegheny College, Bachelor's thesis, **1972.**
2. (and Deines, Peter, and Langmuir, Donald). Seasonal and discharge controls on the chemistry of a conduit spring in the central Pennsylvania karst [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 7, p. 1030, **1977.**
3. (and Deines, Peter, and Langmuir, Donald). Mechanisms controlling the evolution of conduit spring chemistry [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 426, **1978.**

HUMBERTSON, PATRICIA G., *see* Maynard, Bernard R., 1.

HUMPHREVILLE, JAMES A., *see* Foose, Richard M., 3.

HUMPHREYS, CARNEY P.

1. History of streamflow records for the Susquehanna River at Harrisburg, Pa.: Pennsylvania Geology, v. 10, no. 3, p. 6–8, illus., **1979.** A nontechnical description of streamflow records.

HUMPHREYS, MATTHEW

1. (and Friedman, G. M.). Radioactive trace elements in Upper Devonian clastic rocks, north-central Pennsylvania: U.S. Department of Energy Report GJO–740, 13 p., **1972** [not seen].
2. Sedimentary environments in Upper Devonian clastic rocks of north-central Pennsylvania: Troy, N. Y., Rensselaer Polytechnic Institute, M.S. thesis, **1973.**
3. (and Friedman, G. M.). Sedimentary environments in Upper Devonian clastic rocks of north-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 180, **1973.**
4. (and Friedman, G. M.). Late Devonian Catskill deltaic complex in north-central Pennsylvania, *in* Broussard, M. L., ed., Deltas—models for exploration: Houston Geological Society, p. 369–379, illus., **1975.** Three distinctive lithofacies in Lycoming, Sullivan, and Bradford Counties are interpreted as tidal-flat, meandering-stream, and braided-stream deposits derived from greenschist facies rocks of an eastern source area.

HUNT, A. E., *see* Zielinski, R. E., 1.

HUNT, JOHN M., *see* Dickey, Parke A., 1.

HUNTER, P. M.

1. The environmental geology of the Pine Grove Mills-Stormstown area, central Pennsylvania, with emphasis on the bedrock geology and ground water resources: University Park, Pennsylvania State University, M.S. thesis, **1977.**
2. (and Parizek, R. R.). A structurally disturbed zone in central Pennsylvania: surface expression of a domain boundary?, *in* Podwysocki, M. H., and Earle,

J. L., eds., Proceedings of the Second International Conference on Basement Tectonics [Newark, Del., 1976]: Denver, Colo., Basement Tectonics Committee, p. 111–121, illus., **1979.** The McAlevys Fort-Port Matilda lineament is one of the larger and more obvious features of its kind in Pennsylvania. The zone surrounding the feature is structurally complicated and has numerous tear- and thrust-fault structures.

HUNTER, RALPH E.

1. Facies of iron sedimentation in the Clinton Group, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 101–121, illus., **1970.** Depositional environments of the various rock types were interpreted from textures, sedimentary structures, fauna, stratigraphic relationships, and content of nonferrous minerals. The modes of occurrence of iron in the various rock types were considered and environmental implications of the iron mineralogy and petrography were compared with interpretations of environment made by other methods.

HUNTSMAN, JOHN R., *see* Crawford, William A., 2.

ALEX HUTCHINSON AND SON

1. Mine drainage abatement survey, Chalfant Run watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 140, variously paginated, illus., **1975.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

HUTCHINSON, DEBORAH R.

1. (and Wold, R. J.). Lake Erie geological and geophysical data sources: U.S. Geological Survey Miscellaneous Field Studies Map MF–1102, scales 1:400,000 and 1:800,000, 3 sheets, **1979.** A bibliography of various data sources has been compiled. Two forms are used for the presentation: maps showing the locations of different data types and a bibliography listing the references from the maps and additional relevant papers. Charts are included which summarize the data sources for Lake Erie.

HUTNIK, R. J., *see* Beyer, L. E., 1.

HYDE, RICHARD S.

1. Petrology and origin of the Late Precambrian-Early Cambrian Chickies Quartzite of southeastern Pennsylvania: Philadelphia, Temple University, M.S. thesis, **1972;** [abs.], Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 22–23, **1972.**

IANNACCHIONE, ANTHONY T.

1. Geology of the Lower Kittanning coalbed and related mining problems in Cambria County, Pennsylvania: University of Pittsburgh, M.S. thesis, **1977.**
2. Geologic factors affecting the mining of the Lower Kittanning coalbed in Cambria County, Pa. [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 48, **1978.**
3. (and Puglio, D. G.). Geology of the Lower Kittanning coalbed and related mining and methane emission problems in Cambria County, Pa.: U.S. Bureau of

Mines Report of Investigations 8354, 31 p., illus., **1979.** Geologic factors affecting the mining of the Lower Kittanning coal bed were established to aid minability studies; places where coal is missing and types of unstable roof-rock strata were examined.

See also Puglio, Donald G., 3, 4.

INNERS, JON D.

1. A geologic history of Snyder County, Pennsylvania: Snyder County Historical Society Bulletin [for 1966], p. 1–22, illus., **1967.** A brief, nontechnical outline of the geology of the county.
2. Middle Devonian fossils at Shadle, Snyder County, Pennsylvania: Pennsylvania Geology, v. 6, no. 1, p. 7–10, illus., **1975.** This locality is one of the few places in Pennsylvania where relatively complete specimens of Devonian crinoids are known to occur. Other invertebrate fossils are also abundant. A location map is included.
3. The stratigraphy and paleontology of the Onesquethaw Stage [Devonian] in Pennsylvania and adjacent states: Amherst, University of Massachusetts, Ph.D. thesis, **1975;** [abs.], Dissertation Abstracts International, v. 36, no. 6, p. 2673B, **1975.**
4. (and Hess, E. D.). Invertebrate fossils in the upper Mahantango Formation, Suedberg, Schuylkill County, Pennsylvania: Pennsylvania Geology, v. 6, no. 5, p. 8–10, illus., **1975.** A new fossil-collecting locality was located. A list of species identified and a location map are included.
5. Geology and mineral resources of the Berwick quadrangle, Luzerne and Columbia Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 174c, 34 p., illus. including geologic maps, **1978.** A description of the nature and distribution of rock formations and surficial deposits in an area that lies on the crest of one of the major rock fold structures in the Pennsylvania Appalachians.
6. The Pequea ice jam of 1978, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 88–97, illus., **1978.** Ice jams on the 18-mile stretch of the Susquehanna River between Columbia and Holtwood are discussed.
7. (and Wilshusen, J. P.). Triassic-Jurassic diabase dike at Hellam, York County, Pennsylvania: Pennsylvania Geology, v. 9, no. 2, p. 12–15, illus., **1978.** The Hellam dike is one of several thin diabase intrusions of Late Triassic or Early Jurassic age that cut across the York and Lancaster Valleys.
8. (and Wilshusen, J. P., and Branthoover, G. L.). Engineering geology and electric power developments on the lower Susquehanna River, Pennsylvania and Maryland, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 3–73, illus., **1978.** This field trip was designed to familiarize participants with the geology of southeastern Pennsylvania, to examine the development of the electric-power industry on the lower Susquehanna River, and to discuss specific engineering problems in the area.
9. The Onesquethaw Stage in south-central Pennsylvania and nearby areas, *in* Dennison, J. M., and others, Devonian shales in south-central Pennsylvania and Maryland: Annual Field Conference of Pennsylvania Geologists, 44th, Bedford, Pa., Guidebook, p. 38–55, illus., **1979.** Rocks of the Onesquethaw Stage (Lower and Middle Devonian) in south-central Pennsylvania make up a complex of intertonguing marine facies that include shale, limestone, chert, and bentonite. The stratigraphy, paleontology, and lithology are reviewed.

10. (and Daly, P. J.). Ladder-back ripples in the Catskill Formation: Pennsylvania Geology, v. 10, no. 5, p. 7–12, illus., **1979.** The complex ripple marks were found on a single bedding plane in thin-bedded, light-grayish-red, sandy silt-clay laminite at the top of the upper cycle in the Catskill Formation in Columbia County.
11. (and Way, J. H.). The Light Street thrust fault, northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 17, **1979.**

See also Glass, Gary B., 8; Skema, Viktoras W., 1, 2; Wells, Richard B., 7.

IRANI, M. C.

1. (and Hartwell, J. W.). Mineral materials for chemical manufacturing—A survey of supply and demand by the chemical industry in the Ohio River basin of Ohio, Pennsylvania, and West Virginia: U.S. Bureau of Mines Information Circular 8457, 86 p., illus., **1970.** A survey of supply and demand for minerals, metals, alloys, and compounds used by the chemical industries in the Ohio River basin, including kind, quality, quantity, values, sources, specifications, uses, and methods of transportation.

See also Elder, Curtis H., 1.

ISAACS, C. M., JR.

1. State College, Pennsylvania, crustal structure by modeling of long-period P-wave forms from teleseismic earthquakes: University Park, Pennsylvania State University, M.S. thesis, **1979.**

ISAACSON, PETER E., *see* Garlock, Thomas L., 1, 2, 3.

JACOBEEN, FRANK H., JR.

1. (and Kanes, W. H.). Central Broadtop synclinorium and its implications in Appalachian structure [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1893, **1974.**
2. (and Kanes, W. H.). Structure of Broadtop synclinorium and its implications for Appalachian structural style: American Association of Petroleum Geologists Bulletin, v. 58, no. 3, p. 362–375, illus., **1974.** This is the westernmost of the synclinoria in the Valley and Ridge province. More than 125 miles of seismic survey, 22 wells, and surface maps were analyzed to determine the relationship of basement to thin-skinned tectonics.
3. (and Kanes, W. H.). Structure of Broadtop synclinorium, Wills Mountain anticlinorium, and Allegheny frontal zone: American Association of Petroleum Geologists Bulletin, v. 59, no. 7, p. 1136–1150, illus., **1975.** The Broadtop synclinorium and contiguous areas are an important element in the Appalachian structural complex. The tectonic style of deformation is emphasized.

JACOBSEN, THEODORE V., *see* Gale, William F., 1.

JACOBSON, ROGER L.

1. (and Langmuir, Donald). The chemical history of some spring waters in carbonate rocks: Ground Water, v. 8, no. 3, p. 5–9, illus., **1970.** The history of spring waters in carbonate rocks was determined from chemical-quality studies of these and associated groundwaters in the State College, Centre County, area.
2. Controls on the quality of some carbonate ground waters: dissociation constants of calcite and $CaHCO_3$ from 0 to 50°C: University Park, Pennsylvania State

University, Ph.D. thesis, 1973; [abs.], Dissertation Abstracts International, v. 34, no. 8, p. 3842B, 1974.

3. (and Langmuir, Donald). Discharge-geochemical relationships among some carbonate spring waters [abs.]: EOS (American Geophysical Union Transactions), v. 54, no. 4, p. 264, 1973.
4. (and Langmuir, Donald). Controls on the quality variations of some carbonate spring waters: Journal of Hydrology, v. 23, no. 3-4, p. 247-265, illus., 1974. In carbonate-rock terranes in central Pennsylvania, the discharge characteristics and water chemistry of a spring can be predicted by its geographic and hydrogeologic setting. This study involved the discharge and quality of springs located in different hydrogeologic settings.

See also Langmuir, Donald, 1, 5.

JAMBOR, J. L.

1. New occurrences of the hybrid sulphide tochilinite: Geological Survey of Canada Paper 76-1B, p. 65-69, illus., 1976. A detailed examination of tochilinite from the Elbrook Formation at the Grace mine, Morgantown, Berks County, including microprobe, powder diffraction, and single-crystal diffraction data.

JAMES, J. A.

1. Geology disciplines Lancaster Lime and Stone Corporation's quarry development [abs.]: Mining Engineering, v. 25, no. 8, p. 31, 1973.

JANEZIC, GARY

1. Thermal and radiation induced oxidation-reduction in pyroxene minerals: University of Pittsburgh, M.S. thesis, 1975.

JAQUISH, ORIN W., *see* Grice, Darrell G., 1.

JEFFERIS, WILLIAM W. (1820-1906)

1. Mineralogy of Chester County with the localities annexed: unpublished manuscript, 1854; printed by Friends of Mineralogy, Region 3, Special Reprint 2, unpaginated, 1974. Although limited in scope and in some instances incomplete, the manuscript is somewhat remarkable in its organization and depth of coverage in the area involved. It is a valuable reference to localities in Chester County that have been lost to urban development or were long ago mined out and abandoned.

JENNINGS, J. R.

1. Evolution of the frond in a Paleozoic seed fern lineage: American Midland Naturalist, v. 101, no. 2, p. 450-451, illus., 1979. Examination of the geologic history of certain Paleozoic seed ferns indicated that the primitive frond in the group lacked a lamina and bore laterals. The samples are from the Pocono Formation, collected south of Duncannon, Perry County.
2. Plant megafossils from the Mauch Chunk Formation in eastern Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 99-100, 1979.

JENSEN, EARNEST, *see* Yaworski, Michael, 1.

JEPSON, SISTER MARY THERESA

1. Teacher's manual to accompany Bulletin G-59, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., 43 p., illus. [no date]. A teacher's aid to develop the most effective use for classroom and laboratory exercises from *Geology of the Pittsburgh area* (see Wagner, Walter R., 6).

JERAN, PAUL W., *see* McCulloch, Charles M., 2, 4.

JESTER, W. A., *see* Schmotzer, J. K., 1.

JOHN, CHACKO, *see* Gohn, Gregory S., 2.

JOHNSON, ARTHUR, *see* Price, Helen, 1.

JOHNSON, ARVID M.

1. (and Rahn, P. H.). Mobilization of debris flows, *in* Macar, P., ed., New contributions to slope evolution: Zeitschrift fuer Geomorphologie, Supplementband 9, p. 168–186, illus., **1970.** A debris flow in Buffalo Run near State College is described and the mechanism of headward enlargement is discussed.

JOHNSON, LEON J.

1. Clay minerals in Pennsylvania soils—Relation to lithology of the parent rocks and other factors, [Part] 1: Clays and Clay Minerals, v. 18, no. 5, p. 247–260, illus., **1970.** The 348 soil profiles studied represent 117 different soil series from 28 counties; Precambrian to Pliocene parent rocks include igneous, metamorphic, and various sedimentary types. Clay mineral types diverge between different profiles in the same soil series; highly calcareous rock soils may have unusual clay suites.

See also Ranney, Richard W., 1; Roberts, J. M., Sr., 1.

JOHNSON, RICHARD C.

1. (and Myer, G. H.). Sillimanite nodules in the Wissahickon schist, Philadelphia: Pennsylvania Academy of Science Proceedings, v. 49, no. 1, p. 34–36, illus., **1975.** Outcrops of the Wissahickon Schist contain ellipsoidal nodules which are enclaves for sillimanite in the form of fibrolite. The mineralogy, deformational history, and metamorphic petrology are reviewed.

JOHNSTON, HERBERT E.

1. Ground-water resources of the Loysville and Mifflintown quadrangles in south-central Pennsylvania [Perry and Juniata Counties]: Pennsylvania Geological Survey, 4th ser., Water Resource Report 27, 96 p., illus. including geologic maps, **1970.** The area is underlain by strongly folded, deeply weathered Ordovician- to Devonian-age sedimentary rocks. Permeability of the 1- to 50-foot-thick mantle is low, but storage capacity is high.

JOHNSTON, M. T., *see* Cavallaro, J. A., 1.

JOLLEY, RICHARD M., *see* Dennison, John M., 13.

JONES, JERI L.

1. The Bambford [sic] zinc mine: a tribute: Pennsylvania Geology, v. 9, no. 6, p. 7–8, **1978.** The Lancaster County mining operation dates from 1845. Zinc was the predominant ore mined.
2. (and Goodman, Jimell). Brief history and mineralogy of the Dillsburg iron mines, York County, Pennsylvania: Friends of Mineralogy, Pennsylvania Chapter, Newsletter, unpaginated, May **1979.** Brief summary of history and mineral-collecting possibilities, which include datolite crystals.

JONES, KATHLEEN L.

1. A field trip to analyze two geologic provinces of the Harrisburg, Pennsylvania, area: University Park, Pennsylvania State University, M.Ed. paper, **1976.**

JONES, P. L., *see* Ferguson, R. B., 1.

JONES, S. R.

1. Engineering geologic evaluation of the Macedonia excavation, Lewistown Narrows [Mifflin County], *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 205–207, illus., **1978.** In preparation for a new highway, this investigation was made to obtain accurate geologic information.

JONES, T. L., JR., *see* Ferm, John C., 7.

JORDAN, R. R.

1. (and Pickett, T. E., Woodruff, K. D., and others). Preliminary results of the Chester, Pennsylvania earthquake of 28 February 1973 [abs.]: Earthquake Notes, v. 44, no. 1–2, p. 65–66, **1973.**
2. (and Pickett, T. E., Woodruff, K. D., Sbar, M. L., Stephens, C., and Sammis, C.). Delaware-New Jersey-Pennsylvania earthquake of February 1973 [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 41–42, **1974.**

JORDAN, VAN D. F., *see* Schloss, Andres M., 1.

JORDAN, WILLIAM M.

1. Geology and the industrial-transportation revolution in early to mid nineteenth-century Pennsylvania, *in* Schneer, C. J., ed., Two hundred years of geology in America: New Hampshire Bicentennial Conference on the History of Geology, Hanover, N. H., 1976, Proceedings, University of New Hampshire, p. 91–103, **1979.** The nature of the geological-technological relationship that influenced the development of geology as a science in Pennsylvania is examined.
2. J. Peter Lesley (1819–1903), pioneer in the geology of Pennsylvania anthracite [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 102, **1979.**

JUSZLI, MARK P.

1. Fine aggregate in central Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1977.**

KAISER, WILLIAM R.

1. Cyclic sedimentation in the Middle Devonian of south-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 616–617, **1971.**
2. Delta cycles in the Middle Devonian of central Pennsylvania: Baltimore, Johns Hopkins University, Ph.D. thesis, **1972;** [abs.], Dissertation Abstracts International, v. 33, no. 11, p. 5349B, **1973.**

KALINOWSKI, MARIE, *see* Brush, Edward J., 1.

KALMBACH, JOHN H., *see* Crawford, William A., 1.

KAMINSKI, JOSEPH T.

1. (and Merkel, R. H.). Delination [sic] of groundwater flow channels in central Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 53, no. 4, p. 368, **1972.**

See also Merkel, Richard H., 1.

KAMMERER, JOHN C., *see* Gilbert, Bruce K., 1.

KANES, W. H., *see* Jacobeen, Frank H., Jr., 1, 2, 3; Rowlands, David, 2.

KAPLAN, SANFORD S.

1. Analysis of the contact relationship of the northern border of the Newark-Gettysburg Triassic basin: Easton, Pa., Lafayette College, Senior thesis, **1971.**
2. (and Faas, R. W.). An hypothesis concerning the northern border relationship between the Newark-Gettysburg basin and adjacent rock units: Pennsylvania Academy of Science Proceedings, v. 45, p. 9–13, illus., **1971.** The mechanisms responsible for the Triassic contact in the New York-New Jersey area (Hudson Highlands and Newark basin) may be applied to the Pennsylvania region (Newark-Gettysburg Triassic basin), suggesting that the Triassic basins may owe their existence to the reactivation of an ancient fault system during Triassic time.

KARCZ, IAAKOV

1. (and Morreale, Joanne, and Porebski, Francis). Vertical crustal movements in New York and Pennsylvania—Neotectonics or benchmark-instability? [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 7, p. 1138–1139, **1975.**
2. (and Morreale, Joann, and Porebski, Francis). Assessment of benchmark credibility in the study of recent vertical crustal movements: Tectonophysics, v. 33, no. 1–2, p. T1–T6, illus., **1976.** A correlation exists between methods of benchmark mounting and the magnitude of vertical displacement inferred from repeated measurements. In Pennsylvania, more than 300 benchmarks along four lines—Philadelphia-Harrisburg, Harrisburg-Tyrone, Tyrone-Pittsburgh, and Pittsburgh-Massilon, Ohio—were measured in 1941 and 1966. The average vertical displacement was about 5 mm for those mounted on rock, 8 mm on buildings and walls, 18 mm on bridges and culverts, and 24 mm on concrete posts.

KARDOS, L. T., *see* Ciolkosz, Edward J., 1.

KARWEIT, M., *see* Gross, M. G., 1.

KATLIC, J. E.

1. Longwall experience in the Pittsburgh seam: Mining Congress Journal, v. 56, no. 7, p. 38–43, illus., **1970.** The longwall mining method proved to be effective in one western Pennsylvania mine, resulting in increased production. The entire process is described.

KAUFFMAN, MARVIN E.

1. (and Campbell, Lyle). Kinzers Formation—Appalachian analogue of Burgess Shale? [abs.]: American Association of Petroleum Geologists Bulletin, v. 54, no. 5, p. 854, **1970.**
2. (and Frey, E. P.). Antietam sandstone ridges—exhumed barrier islands or fault-bounded blocks? [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 18, **1979.**

See also Freedman, Jacob L., 1; Ritter, Dale F., 1.

KEBBLISH, WILLIAM

1. The mineral industry of Pennsylvania in 1974: Pennsylvania Geological Survey, 4th ser., Information Circular 82, 39 p., illus., **1978**; reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1974, v. 2, p. 583–621, illus., **1977.**
2. The mineral industry of Pennsylvania in 1975: Pennsylvania Geological Survey, 4th ser., Information Circular 85, 28 p., illus., **1979**; reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1975, v. 2, p. 625–652, illus., **1978.**
3. (and Socolow, A. A.). Minerals in the economy of Pennsylvania: U.S. Bureau of Mines State Mineral Profile SMP–37, 18 p., illus., **1978.** Developments pertaining to the mineral industry in 1977, including mining, shipment, utilization, and government activities. The value of minerals produced increased 5 percent from 1976, and totaled 3.2 billion dollars.
4. The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1976, v. 2, p. 627–658, illus., **1979.**
5. (and Socolow, A. A.). Minerals in the economy of Pennsylvania: U.S. Bureau of Mines State Mineral Profile, 22 p., illus., **1979.** Developments pertaining to the mineral industry in 1978, including mining, utilization, employment, and government activities. The value of minerals produced decreased 6 percent from 1977, and totaled 2.8 billion dollars.

KEECH, T. W., *see* Greenfield, R. J., 2; Shuck, L. Z., 1.

KEENEY, JAMES F., *see* Frantz, Robert L., 1.

KEIDEL, F. A.

1. (and Montgomery, A., Wolfe, C. W., and Christian, R. P.). Calcian ancylite from Pennsylvania: new data: Mineralogical Record, v. 2, no. 1, p. 18–25, 36, illus., **1971.** New data have been obtained for ancylite, a hydrated basic carbonate of strontium, calcium, and the cerium group of rare earths, from Cornog, Chester County.
2. The Kibblehouse quarry: Rocks and Minerals, v. 53, no. 3, p. 128–129, illus., **1978.** This southeastern Pennsylvania quarry yields numerous minerals for the amateur collector. A complete list of species is included.

KEIDEL, STEPHEN J., *see* Leonard, Jay E., 1.

KEITH, MacKENZIE L., *see* Degens, Egon T., 1; Rose, Arthur W., 2, 5, 10, 11; Weber, Jon N., 1, 2; Williams, Eugene G., 12.

KELLER, E. C., JR., *see* Canary, P. E., 1.

KELLEY, DANA R.

1. (and McGlade, W. G.). Medina and Oriskany production along the shore of Lake Erie, Pierce field, Erie County, Pennsylvania, *in* Ontario Petroleum Institute Conference [7th, Windsor, 1968, Proceedings]: Chatham, Ontario, Ontario Petroleum Institute Technical Paper 10, 41 p., illus., **1968** [not seen].
2. A summary of major geophysical logging methods: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 61, 82 p., illus., **1969.** The principles of modern geophysical logging methods, the effects to be considered in the evaluation of these methods, and the uses of the methods are summarized in the text, figures, and tables.

3. (and Lytle, W. S., Wagner, W. R., and Heyman, Louis). Oil and gas developments in Pennsylvania in 1969 with ten year review and forecast: Pennsylvania Geological Survey, 4th ser., Progress Report 181, 65 p., illus., **1970.**
4. (and Lytle, W. S., Wagner, W. R., and Heyman, Louis). The petroleum industry and the future petroleum province in Pennsylvania, 1970: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 65, 39 p., illus., **1970.** The oil and gas potential of western Pennsylvania is discussed.
5. Wilmerding landslide, cooperative Pennsylvania Geological Survey emergency effort: Pennsylvania Geology, v. 2, no. 3, p. 11–12, illus., **1971.** An example of how the Survey can aid communities faced with emergency geological problems.
6. (and Wagner, W. R.). Surface to Middle Devonian (Onondagan) stratigraphy, Part I (STOMDES): Pennsylvania Geological Survey, 4th ser., Open-File Report, Pittsburgh office, 15 p., 8 cross sections, vertical scale 1 inch = 100 feet, **1972.**
7. (and Balogh, L. J.). Salina or equivalent and deeper penetrations of Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report, Pittsburgh office, scale 1:500,000, **1973.**
8. (and Heeren, L. A.). Tully and deeper formations, brine analysis of Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report, Pittsburgh office, 1 chart and map, scale 1:500,000, **1973.**

See also Lytle, William S., 6, 7.

KELLY, FORD D.

1. Hydrologic properties of a dolomite aquifer as exemplified by petroleum product recovery processes, Whitemarsh [Montgomery County], Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1974.**

KENNARD, F. L., *see* Williamson, W. O., 1.

KENNISH, MICHAEL J., *see* Blackbeer, Lawrence E., 1.

KENT, BION H.

1. Geologic map of the Garards Fort quadrangle and part of the Osage quadrangle, Greene County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–663, scale 1:24,000, **1971.** Pennsylvanian-Permian rocks and Quaternary alluvium are mapped. Structure contours on the base of the Pittsburgh coal bed are included. Coal, gas, and sandstone are the main mineral resources in the area.
2. (and Gomez, Manuel). Paleotopographic-structural controls on thickness and composition of Pittsburgh coal in southwestern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 622, **1971.**
3. Geologic map of the Prosperity quadrangle [Washington and Greene Counties], southwestern Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ–1003, scale 1:24,000, **1972.** Pennsylvanian and Permian rocks are shown, along with Quaternary alluvium. Mineral deposits include coal, oil and gas, limestone, and sandstone. Also included are isopach maps of major sandstone units and coal beds.
4. (and Gomez, M.). Geologic factors that control thickness and composition of Upper Pennsylvanian coals in Appalachian basin [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 3, p. 631–632, **1972.**
5. Geologic map of parts of the Masontown and Morgantown North quadrangles, Greene County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–743, scale 1:24,000, **1973.** Pennsylvanian to Permian geology is depicted. Mineral resources include coal, oil and gas, and sandstone.

6. Geologic causes and possible preventions of roof fall in room-and-pillar coal mines: Pennsylvania Geological Survey, 4th ser., Information Circular 75, 17 p., illus., **1974**; reprinted *in* Root, S. I., compiler, Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey, 4th ser., Information Circular 84, p. 7–27, illus., **1979.** Several structural and sedimentary features directly affecting shale roof stability in Pittsburgh coal mines were identified by core drilling, geologic mapping, and mapping roof falls in an area of active underground mining in eastern Greene County, Pennsylvania.
7. (compiler). Isopach maps of overburden on the Pittsburgh coal bed in southwestern Pennsylvania and northern West Virginia: U.S. Geological Survey Open-File Report 74–132, 8 p., illus. including 7 pls., scale 1:62,500, **1974** [not seen].

See also Berryhill, Henry, Jr., 1; Gomez, Manuel, 3; Schweinfurth, Stanley P., 1.

KEPFERLE, R. C., *see* Broadhead, R. F., 1; de Witt, Wallace, Jr., 9.

KEPPIE, J. DUNCAN

1. The Martic thrust and the ages of the Wissahickon schist and Octoraro phyllite—new structural data [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 25–26, **1970.**

KERNS, EARL G.

1. Clay dikes in the Pittsburgh coal (Pennsylvanian) of southwestern Greene County, Pennsylvania: Morgantown, West Virginia University, M.S. thesis, **1971.**

KESSLER, THEODORE

1. (and Sharkey, A. G., Jr., and Friedel, R. A.). Spark-source mass spectrometer investigation of coal particles and coal ash: U.S. Bureau of Mines Technical Progress Report 42, 15 p., **1971** [not seen].
2. (and Sharkey, A. G., Jr., and Friedel, R. A.). Analysis of trace elements in coal by spark-source mass spectrometry: U.S. Bureau of Mines Report of Investigations 7714, 8 p., illus., **1973.** Includes one anthracite and five bituminous samples from Pennsylvania.

KHOURY, S. G.

1. (and Hipwell, R. M.). Unsuspected source of water pollution in southwestern Pennsylvania: Pennsylvania Geology, v. 5, no. 5, p. 2–4, illus., **1974.** Golf courses constructed over shallow underground mines have added to the problem of acid drainage.
2. (and Tillman, J. E., and Wallach, J. L.). Expression of lithologies and structures on aeromagnetic and gravity maps of the Piedmont in the central Appalachians [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 209–210, **1976.**

See also Tillman, James E., 1; Wallach, Joseph L., 1.

KIEFER, KIRBY E.

1. A fracture study of the Geneva quadrangle, Crawford County, Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1975.**

KILINC, ISHAK A.

1. Experimental metamorphism and anatexis of shales and graywackes: University Park, Pennsylvania State University, Ph.D. thesis, **1969**; [abs.], Dissertation Abstracts International, v. 31, no. 2, p. 760B, **1970.**

KIM, ANN G.

1. Methane in the Pittsburgh coalbed, Washington County, Pa.: U.S. Bureau of Mines Report of Investigations 7969, 16 p., illus., **1974.** Because of the similarity between natural gas and methane drained from coal, the methane can be recovered and added to pipeline supplies of natural gas. The estimated methane content of the Pittsburgh coal in the report area is over 130 billion cubic feet.
2. Methane in the Pittsburgh coalbed, Greene County, Pa.: U.S. Bureau of Mines Report of Investigations 8026, 10 p., illus., **1975.** Drainage of methane in advance of mining is considered. Virgin Pittsburgh reserves in western Greene County are estimated to contain over 375 billion cubic feet of gas.

L. ROBERT KIMBALL

1. Two Lick Creek mine drainage pollution abatement project: Pennsylvania Department of Mines and Mineral Industries, Operation Scarlift Project SL 109, 265 p., illus., **1971.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. Southern Latrobe syncline, Youghiogheny River basin mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 103-4, variously paginated, illus., **1975.** See annotation in entry 1 above.
3. Feasibility report for mine sealing of the Cherryhill No. 1 and Victor No. 47 mine complex, Upper Two Lick Creek watershed, Indiana County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 109-201.5, 24 p., unpaginated appendices, illus., **1976.** Includes several test-boring logs.

KIMMEL, GRANT E.

1. (and Schiner, G. R.). The Shenango Formation (Mississippian) in northwestern Pennsylvania: U.S. Geological Survey Bulletin 1294-C, 13 p., illus., **1970.** The top two units of Mississippian rock are defined as upper and lower members of the Shenango Formation. The upper member is mostly shale, and the lower member is principally made up of sandstone and subordinate interbedded shales.

See also Schiner, George R., 1, 2.

KIMUTIS, ROBERT, *see* Donaldson, Alan C., 3, 4.

KING, CUCHLAINE A. M.

1. (and Coates, D. R.). Glacio-periglacial landforms in the Great Bend area of the Susquehanna [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 183-184, **1973.**
2. (and Coates, D. R.). Glacio-periglacial landforms within the Susquehanna Great Bend area of New York and Pennsylvania: Quaternary Research, v. 3, no. 4, p. 600-620, illus., **1973.** The geomorphology of an unusually well developed hierarchy of small landforms in the Great Bend area is discussed.

See also Coates, Donald R., 3, 4.

KING, ELIZABETH R.

1. (and Zietz, Isidore). The New York-Alabama lineament: geophysical evidence for a major crustal break in the basement beneath the Appalachian basin: Geology, v. 6, no. 5, p. 312-318, illus., **1978.** The lineament is shown in a composite

aeromagnetic map. The authors attempt to relate this feature to other geophysical and geological information for this part of the North American continent.

KING, JOHN

1. (and Banerjee, S. K., Bogdan, D., Lund, S. P., Marvin, J., Woodrow, Donald, and Russell, Allan). A comparison of the paleomagnetic records of sediments from Lake Seneca, New York, Lake LeBoeuf, Pennsylvania and Lake St. Croix, Minnesota [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 18, p. 243, **1979.**

KINSEY, W. FRED, III

1. Faucett and Byram sites: chronology and settlement in the Delaware Valley: Pennsylvania Archaeologist, v. 45, no. 1-2, p. 1-103, illus., **1975.** This archeological site is in the proposed Tocks Island Reservoir area. The geologic setting consists of ridges of folded Paleozoic sedimentary rocks and broad alluvial Wisconsinan terraces on the valley floor.

See also Ritter, Dale F., 1.

KIRCHGASSER, WILLIAM T.

1. Stratigraphic sequence of the ammonoid *Probeloceras* Clarke in the Upper Devonian of the Appalachian basin [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 44-45, **1974.**

KIRK, KEITH G.

1. Resistivity and gravity surveys applied to karst research, *in* Rauch, H. W., and Werner, Eberhard, eds., Conference on Karst Geology and Hydrology, 4th, Proceedings, p. 61-71, illus., **1974** [not seen].

KIRK, WILLIAM S., *see* Higgins, Michael W., 6.

KIRKLAND, JAMES T.

1. A reevaluation of the problem of the upper Delaware River drainage evolution [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 184, **1973.**

See also Coates, Donald R., 6.

KISHBAUGH, JAMES W.

1. The geology and its relationship to the present landscape of Luzerne and surrounding counties: University Park, Pennsylvania State University, M.Ed. thesis, **1976.**

KISSELL, FRED N.

1. The potential hazards of methane gas in oil shale mines: Colorado School of Mines Quarterly, v. 70, no. 4, p. 19-27, illus., **1975.** The U.S. Bureau of Mines technique for measuring methane content of virgin coal is applied to oil shales. Figure 1 shows coal mine methane emissions in Washington and Greene Counties.

See also Moore, T. D., Jr., 1.

KLEMIC, HARRY

1. (and Cooper, M. C.). Airborne radioactivity survey of parts of Carbon, Schuylkill, and Monroe Counties, Pennsylvania: U.S. Geological Survey Open-File Report 75-91, 3 p., 13 pls., scale 1:24,000, **1975** [not seen].

See also Finkelman, Robert B., 2.

KLOSE, WILLIAM F., II

1. Edward S. Jones fossil plant collection curated: Pennsylvania Geology, v. 7, no. 5, p. 13–14, illus., **1976.** One hundred forty Pennsylvania fossil plants collected from coal mines in the Scranton, Lackawanna County, area between 1900 and 1920 were catalogued by the Mineralogical Society of Northeastern Pennsylvania.

KLUNK, WILLIAM J.

1. Collecting at the Pennsylvania copper mines: Rocks and Minerals, v. 50, no. 2, p. 129–131, illus., **1975.** The several copper mines in Adams County are briefly discussed. Commodities are listed for each site, and a location map is included.
2. The trilobites of Swatara Gap [Lebanon County], Pennsylvania: Rocks and Minerals, v. 51, no. 4, p. 189–190, illus., **1976.** This popular collecting locality is summarized, and a location map is included.

KNAPP, STEPHEN D., *see* Leonard, Jay E., 1.

KNIGHT, F. JAMES

1. Some problems of urban growth in limestone terrains of Pennsylvania [abs.]: Association of Engineering Geologists, Annual Meeting, Program and Abstracts, p. 15–16, **1970.**
2. Geologic problems of urban growth in limestone terrains of Pennsylvania: Association of Engineering Geologists Bulletin, v. 8, no. 1, p. 91–101, illus., **1971.** The problems of caves and sinkholes in limestone terrains are generally known. People must be educated to the seriousness of development in such areas.
3. Tropical storm Agnes—Comments on the storm and flooding, *in* Faill, R. T., ed., Structure and Silurian-Devonian stratigraphy of the Valley and Ridge province, central Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 38th, Camp Hill, Pa., Guidebook, p. 47–50, **1973.** The flooding that occurred as a result of tropical storm Agnes is reviewed and compared to the flooding that occurred in 1936.

See also Pedlow, George W., III, 1.

KNOX, WILLIAM D., *see* Lystrom, David J., 1.

KO, H.-Y., *see* Cook, N. E., Jr., 1.

KOCHEL, R. CRAIG

1. Morphology, structure, and origin of two blockfields and associated deposits, northern Berks County, Pennsylvania (River of Rocks & Devil's Potato Patch): Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1975.**

See also Moss, John H., 1, 3.

KOERNER, ROBERT M., *see* McCabe, W. Martin, 1; Partos, A., 1.

KOESTER, HARRY E.

1. (and Lescinsky, Joseph). Selected hydrologic data, Clarion River and Redbank Creek basins, northwestern Pennsylvania—an interim report: U.S. Geological Survey Open-File Report 76–445, 164 p., illus., **1976.** Data are presented on stream discharge, chemical quality, and biota from over 100 stream collection sites.

See also Hollowell, Jerrald R., 6.

KOHL, WILLIAM R.

1. (and Briggs, R. P.). Maps of rock types in bedrock of Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-685-A,

scale 1:50,000, 2 sheets, 1975. The rocks likely to be found at or near the surface are indicated. The general engineering characteristics of the rock types are estimated and the most common rock types are described in greater detail.

2. Map of overdip slopes that can affect landsliding in Armstrong County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-730, scale 1:125,000, 1976. Overdip slopes are divided into three categories: 40 to 100 feet per mile, 100 to 200 feet per mile, and over 200 feet per mile. The area of greatest dip is in the southeastern portion of the county.
3. (and Briggs, R. P.). Summary map of mined areas and areas of potential coal mining, southwestern Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-729, scale 1:250,000, 1976. The purpose of the map is to show areas where environmental effects of coal mining, including subsidence, dewatering of aquifers, earth disturbance resulting from surface mining, and discharge of mineralized water, may pose problems to regional planning.

See also Briggs, Reginald P., 4, 6; Davies, William E., 25.

KOHLAND, WILLIAM F.

1. Soils of Erie and Jefferson Counties, Pennsylvania: a geographic study and comparison of the distribution and utilization of soils in a glaciated and a non-glaciated area: University of Tennessee, Ph.D. thesis, 1969; [abs.], Dissertation Abstracts International, v. 30, no. 8, p. 3453B, 1970.

KOMAR, C. A.

1. (and Shuck, L. Z., Overbey, W. K., Jr., and Anderson, T. O.). Delineating a subsurface fracture system in a petroleum reservoir; an experiment: Journal of Petroleum Technology, v. 25, no. 5, p. 531–537, illus., 1973 [not seen].

KONIKOW, LENNY F.

1. Mountain runoff and its relation to recharge to the carbonate aquifers of Nittany Valley, Pennsylvania, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 79–85, illus., 1971; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 79–85, illus., 1971. During the study period, over 80 percent of all mountain runoff became subsurface flow in the carbonate valley; however, most of this flow emerged in conduit-fed springs.

KOOPMAN, KARL F.

1. Catalog of type specimens of recent mammals in the Academy of Natural Sciences at Philadelphia: Academy of Natural Sciences of Philadelphia Proceedings, v. 128, p. 1–24, 1976. The extant type specimens of recent mammals located in the collections of the Academy are listed, each accompanied by a brief statement of the nature of the specimen, bibliographical reference, current nomenclature status, and some indication of why it is regarded as a type.

KOPAS, FRANK A.

1. Soil survey of Fayette County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 108 p., illus. including soils maps, 1973. Includes detailed descriptions and maps of the soils, as well as sections on use and management, and formation and classification of the soils.

KOPPE, EDWIN F.

1. English Run, Otter Run mine drainage abatement measures, Lycoming County, Pennsylvania: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 160, 25 p., illus., **1975.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

KORNER, LISA A.

1. Radon in stream and ground waters of Pennsylvania as a reconnaissance exploration technique for uranium deposits: University Park, Pennsylvania State University, M.S. thesis, **1977.**
2. (and Rose, A. W.). Radon in streams and ground waters of Pennsylvania as a guide to uranium deposits: U.S. Energy Research and Development Administration Report GJO-1659-2 (GJBX-60-77), 151 p., illus., **1977.** Evaluation of a method using a portable radon detector. Streams are not useful for reconnaissance uranium exploration, but groundwater is recommended. Includes radon data from 149 groundwater samples from central and eastern Pennsylvania.

See also Rose, Arthur W., 15.

KOSOWSKI, Z. V.

1. Control of mine drainage from coal mine mineral wastes (progress report): Symposium on Coal Mine Drainage Research, 4th, Pittsburgh, Pa., 1972, Papers, p. 423-424, **1972.** A coal mine refuse pile was graded, covered with 20 tons/acre of agricultural limestone as a barrier, covered with soil, and planted with grass. One half of the associated slurry lagoons were treated with a chemical stabilizer, and the other half were planted with grass. Results of subsequent monitoring were not available.

KOWALIK, WILLIAM S.

1. Application of satellite photographic and MSS data to selected geologic and natural resource problems in Pennsylvania— III,-Comparison of Skylab and Landsat lineaments with joint orientations in northcentral Pennsylvania, *in* Proceedings of the NASA Earth Resources Survey Symposium [Houston, Tex., 1975], Volume I-B, Technical sessions presentations—Geology—information systems and services: U.S. National Aeronautics and Space Administration Technical Memorandum X-58168, p. 958-969, illus., **1975.** A subparallel relationship exists between lineaments, major shale joints, and coal cleats in part of the Allegheny Plateau and is consistent with a tensional rather than a shear model.
2. Use of Landsat-1 imagery in the analysis of lineaments in Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1975.**
3. (and Gold, D. P.). Application of satellite photographic and MSS data to selected geologic and natural resource problems in Pennsylvania—I,-Lineaments and mineral occurrences in Pennsylvania, *in* Proceedings of the NASA Earth Resources Survey Symposium [Houston, Tex., 1975], Volume I-B, Technical sessions presentations—Geology—information systems and services: U.S. National Aeronautics and Space Administration Technical Memorandum X-58168, p. 933-950, illus., **1975.** The association of metallic mineralization and lineaments in Pennsylvania suggests a possible genetic relationship, particularly with the Perkiomen Creek lineament and the Tyrone-Mount Union lineament complex.

4. (and Gold, D. P.). The use of Landsat-1 imagery in mapping lineaments in Pennsylvania, *in* Hodgson, R. A., and others, eds., Proceedings of the First International Conference on the New Basement Tectonics [Salt Lake City, Utah, 1974]: Utah Geological Association Publication 5, p. 236–249, illus., **1976.** Lineaments of short to intermediate length were mapped for Pennsylvania to determine if preferred lineament trends exist and if a relationship exists between orientation of joint and lineament trends.

See also Alexander, Shelton S., 2.

KOWALL, STEPHEN J.

1. Hydrogeology in folded and non-folded Appalachian terranes in Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 625–626, **1971.**
2. Hydrogeology and geomorphology of two structurally dissimilar terranes in Pennsylvania: Binghamton, State University of New York, Ph.D. thesis, **1975;** [abs.], Dissertation Abstracts International, v. 35, no. 12, pt. 1, p. 5946B, **1975.**
3. Relationship of the hypsometric integral to low streamflow duration for some Pennsylvania watersheds [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 85, **1975.**
4. The hypsometric integral and low streamflow in two Pennsylvania provinces: Water Resources Research, v. 12, no. 3, p. 497–502, illus., **1976.** Streamflow duration data from the Appalachian Plateau and the folded Appalachian Mountains showed that siltstone-shale areas produce as much low streamflow per unit as do sandstone areas.

KRAFT, M. L., *see* Meyers, R. A., 1.

KRAJEWSKI, STEPHEN A.

1. (and Williams, E. G.). Upper Devonian flagstones from northeastern Pennsylvania: Pennsylvania State University, College of Earth and Mineral Sciences Special Publication 3–71, 185 p., illus., **1971.** The geology of flagstones is presented and means of testing their composition explained.
2. (and Williams, E. G.). Upper Devonian sedimentation in Susquehanna County and its applications in the prediction and mining of flagstone, *in* Krajewski, S. A., and others, Upper Devonian sedimentation in Susquehanna County *and* Hydrology, glacial geology and environmental geology of the Wyoming-Lackawanna Valley: Annual Field Conference of Pennsylvania Geologists, 36th, Wilkes-Barre, Pa., Guidebook, p. 1–76, illus., **1971.** A discussion of the geology, composition, texture, and physical properties of flagstone. The authors review the technical aspects of flagstone production and utilization and provide a basis for a better understanding of the flagstone resources of Pennsylvania and of the properties that affect the discovery, development, and use of flagstone. A road log is included.
3. (and Williams, E. G., and Hollowell, J. R.). Upper Devonian sedimentation in Susquehanna County *and* Hydrology, glacial geology and environmental geology of the Wyoming-Lackawanna Valley: Annual Field Conference of Pennsylvania Geologists, 36th, Wilkes-Barre, Pa., Guidebook, 103 p., illus., **1971.** The geology, composition, texture, and physical properties of flagstone from Susquehanna County are discussed in the first part of the guidebook. In the second part, Pleistocene deposits and environmental problems resulting from anthracite coal mining in the Wyoming-Lackawanna Valley are discussed.

4. The relationship between bedforms, occurrence, composition, texture, and physical properties of the Upper Devonian flagstones in northeastern Pennsylvania: University Park, Pennsylvania State University, M.S. paper, **1972.**
5. (and Cuffey, R. J.). The Ashcraft limestone mound [Susquehanna County]: Pennsylvania Geology, v. 7, no. 5, p. 9–12, illus., **1976.** The limestone deposit is of interest because the Upper Devonian rocks of northeastern Pennsylvania are mostly sandstone, siltstone, and shale.
6. (and Cuffey, R. J.). The Ashcraft-quarry limestone mound, an Upper Devonian shell-bank in northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 212, **1976.**
7. (and Williams, E. G.). Stratigraphy of the Late Devonial [sic] New Milford Formation in northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 289, **1977.**

See also Lytle, William S., 27; Piotrowski, Robert G., 2, 3, 4, 5, 6, 7, 8, 9, 10, 11.

KRANZ, V. R., *see* Engman, Edwin T., 3.

KRAYBILL, R. L.

1. Ground water quality, variation, and trends in Schantz Spring basin and adjacent areas of southwestern Lehigh County, Pennsylvania: New Brunswick, N. J., Rutgers University, M.S. thesis, **1977.**

KREIMEYER, DEBORAH F., *see* Roen, John B., 7.

KREPS, LORRAINE F.

1. (and Wright, T. O.). Provenance of the Hamburg klippe graywackes [abs.]: Pennsylvania Academy of Science Proceedings, v. 52, no. 1, p. 105, **1978.**

See also Wright, Thomas O., 7.

KROHN, D., *see* Podwysocki, M. H., 2.

KROHN, M. DENNIS

1. (and Gold, D. P.). Application of satellite photographic and MSS data to selected geologic and natural resource problems in Pennsylvania—II,-Relation of lineaments to sulfide deposits: Bald Eagle Mountain, Centre County, Pennsylvania, *in* Proceedings of the NASA Earth Resources Survey Symposium [Houston, Tex., 1975], Volume I-B, Technical sessions presentations—Geology—information systems and services: U.S. National Aeronautics and Space Administration Technical Memorandum X-58168, p. 951–957, illus., **1975.** Direct spatial correlation of sulfide mineralization with lineaments on Bald Eagle Mountain is low, but their common asymmetrical association suggests a relationship.
2. (and Gold, D. P.). Relation of lineaments to sulfide deposits: Bald Eagle Mountain, Centre County, Pennsylvania: Pennsylvania State University ORSER/SSEL Technical Report 9–75, 7 p., illus., **1975.** Direct spatial correlation is low, but systematic dislocation is possible.
3. Relation of lineaments to sulfide deposits and fractured zones along Bald Eagle Mountain: Centre, Blair, and Huntingdon Counties, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1976.**
4. Enhancement of Landsat images for lineament analysis in the area of the Salina basin, New York and Pennsylvania: U.S. Geological Survey Open-File Report 79–533, 49 p., illus., **1979.**
5. Field relations of lineaments to gossans and geochemical anomalies along Bald Eagle Mountain, Centre County, Pennsylvania [abs.], *in* Podwysocki, M. H.,

and Earle, J. L., eds., Proceedings of the Second International Conference on Basement Tectonics [Newark, Del., 1976]: Denver, Colo., Basement Tectonics Committee, p. 485, **1979.**

KROTHE, NOEL C.

1. Quality changes in surface water by streambed infiltration in a carbonate terrane, central Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1973.**
2. Factors controlling the water chemistry beneath a floodplain in a carbonate terrane, central Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1976**; [abs.], Dissertation Abstracts International, v. 37, no. 11, p. 5584B, **1977.**
3. (and Parizek, R. R.). Anomalous occurrence of sodium bicarbonate water in a carbonate terrane [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 964, **1976.**
4. (and Parizek, R. R.). An anomalous occurrence of sodium bicarbonate water in a flood plain in a carbonate terrane: Ground Water, v. 17, no. 6, p. 595–603, illus., **1979.** Geochemical factors controlling water chemistry in an influent stream and adjacent floodplain sediments were studied. Water beneath the floodplain, springs, and channel was calcium carbonate, but the soil water beneath the channel was mainly sodium bicarbonate in character.

KRUEGER, ALLEN R.

1. Alpha's sand and gravel deposit and processing plant at Martins Creek, Pennsylvania, *in* Hoover, K. V., ed., Proceedings, Fifth Forum on Geology of Industrial Minerals [Harrisburg, Pa., 1969]: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 64, p. 91–103, illus., **1970.** The glacial deposit at Martins Creek contains abundant coarse gravel. The design of a processing plant for sand and gravel meeting Pennsylvania Department of Transportation specifications, and based on a geologic investigation of the deposit, is a good example of applied industrial geology.

KRUGER, FREDRICK G.

1. Geology of the Coopersville area, Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1975.**

KUEHN, KENNETH W.

1. An automated microscopical method for the characterization of pyrite in coal: University Park, Pennsylvania State University, M.S. thesis, **1979.**

KUHL, A. D., *see* Cunningham, Robert L., 1.

KUHLMAN, ROBERT

1. Stratigraphy and metamorphism of the Wissahickon Formation in southeastern Chester County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 213, **1976.**

KULANDER, BYRON R.

1. (and Dean, S. L.). Gravity, magnetics, and structure of the Allegheny Plateau/western Valley and Ridge in West Virginia and adjacent states: West Virginia Geological and Economic Survey Report of Investigations RI-27, 91 p., illus. including gravity survey and magnetic survey maps, **1978.** The extreme southern border area of the Appalachian Plateaus and Valley and Ridge provinces is included in this study of gravity and magnetic surveys. Anomalies have been

detected which can be related to Paleozoic cover and basement structures. Some of the gravity values presented in tabular form include data from Pennsylvania.

KULP, KENNETH P., *see* Barker, James L., 3.

KUMAR, A.

1. Some trace fossils from Clinton red sandstone (Early Silurian) from Harrisburg area, Pennsylvania and their environmental significance: Palaeontological Society of India Journal, v. 21-22, p. 29-32, illus., **1977** [not seen].

KUSIAK, JOHN R.

1. A detailed gravity and magnetic interpretation of the structure and deformational history of the Jacksonwald syncline, Berks County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1977.**

LACHMAN, R. I.

1. (and Lovell, H. L.). An investigation of the natural beneficiation of coal mine drainage: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report SR-76, 187 p., illus., **1970.** Temperatures, flow rates, aeration, sediments, densities, chemical composition, and depth of channels affect the degree of beneficiation when mine effluent enters a free-flowing stream or a pond of fresh water. Low temperatures had the greatest positive influence.

LaFLURE, J. ERNEST

1. Hydrologic impacts of urbanization and some proposed solutions [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 72, **1978.**

See also Morisawa, M., 1.

LALLI, B. M., *see* Duvel, William A., Jr., 1.

LALLY, FREDERICK C.

1. A geological-environmental evaluation of the Sunnyside area [Lancaster County]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

LAMBERT, STEPHEN W., *see* McCulloch, Charles M., 5; Steidl, Peter F., 4.

LAMBORN, RICHARD

1. (and Gutschick, R. C.). *Bifungites,* trace fossils from Devonian-Mississippian rocks of Pennsylvania and Montana [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 6, p. 525, **1974.**
2. (and Gutschick, Raymond). Double-arrow trace fossils in northwestern Pennsylvania: Pennsylvania Geology, v. 7, no. 6, p. 2-5, illus., **1976.** The burrow trace fossil *Bifungites* is reviewed, and collection localities are identified.
3. The paleontology of western Pennsylvania: Rocks and Minerals, v. 53, no. 3, p. 99-103, illus., **1978.** Some of the more spectacular fossil finds in western Pennsylvania are reviewed.

See also Gutschick, Raymond C., 1.

LAND, J. S., *see* Meyers, R. A., 1.

LANDRY, STUART O., *see* Coates, Donald R., 2.

LANGMUIR, DONALD

1. (and Jacobson, R. L.). The hydrochemistry of sinking and resurgent streams in carbonate rocks of central Pennsylvania [abs.]: Water Well Journal, v. 23, no. 9, p. 23, **1969.**
2. Chemical analyses, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 118–121, **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 118–121, **1971.** A description of how certain dissolved constituents were analyzed and how thermochemical data and carbonate equilibria were calculated for various geochemical studies of groundwater in the State College area.
3. Ground-water pollution, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 148–153, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 148–153, illus., **1971.** The resulting effect of land use practices on the chemical character of the groundwater in the Nittany Valley area is discussed.
4. The geochemistry of some carbonate ground waters in central Pennsylvania: Geochimica et Cosmochimica Acta, v. 35, no. 10, p. 1023–1045, illus., **1971.** Dissolved oxygen and other aqueous species were measured in 29 springs and 29 wells in Paleozoic carbonate rocks near State College, Centre County. Contrary to earlier studies, the results from these tests suggest that fewer groundwaters in carbonate rocks are supersaturated with calcite and dolomite than was previously suggested.
5. (and Jacobson, R. L.). Hydrochemistry of ground waters in carbonate rocks near State College, Pennsylvania, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 126–132, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 126–132, illus., **1971.** The degree of saturation with respect to calcite and dolomite and the geochemical evolution of some well and spring waters in the carbonate rocks near State College are discussed.
6. (and White, W. B.). Natural ground-water geochemistry, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 115–133, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 115–133, illus., **1971** [includes articles by other authors, which are annotated separately]. Several groundwater studies of the carbonate rocks near State College pertain to the significance of temperature, concentrations of Ca^{2+}, Mg^{2+}, and HCO_3^-, and derived parameters including molar Ca^{2+}/Mg^{2+} ratios, CO_2 pressure, and saturation indices for calcite and dolomite.
7. Controls on the amounts of pollutants in subsurface waters: Earth and Mineral Sciences, v. 42, no. 2, p. 9–13, illus., **1972.** To avoid groundwater pollution the controls on release and subsurface movement of water pollutants and the capacity of soil and rock systems to purify them must be understood.

8. (and Sears, S. O., and Wright, J. C., Jr.). The geochemistry of Cu, Zn, Fe, and Mn in soil moisture in a Pennsylvania soil [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 7, p. 1160–1161, **1975.**

See also Apgar, Michael A., 1; Applin, Kenneth R., 2; Deines, Peter, 1; Gang, Michael W., 2; Harmon, Russell S., 6; Hull, Laurence C., 2, 3; Jacobson, Roger L., 1, 3, 4; Parizek, Richard R., 10; Sears, Stephen O., 1, 3; Suarez, Donald L., 1, 3, 4.

LANNING, ROBERT M.

1. An olivine tholeiite dike swarm in Lancaster County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1972.**

See also Smith, Robert C., II, 17.

LAPHAM, DAVIS M.

1. Pennsylvania minerals [11]: Keystone Newsletter, v. 12, no. 9, p. 5, **1963.** Discussion of zeolites from the #4 mine at Cornwall.
2. Calciostrontianite(?): Pennsylvania Geology, v. 1, no. 9, p. 11, **1970.** A mineral found at a Keyser limestone quarry at Winfield, Union County, previously identified as strontianite, may be calciostrontianite.
3. Potentially economic nickel in Pennsylvania: Pennsylvania Geology, v. 1, no. 6, p. 13–14, illus., **1970.** According to recent studies, southern Lancaster and Chester Counties contain rock types that have potential for the development of a nickel mining industry.
4. (and Saylor, T. E.). Chemical analyses of three Triassic(?) diabase dikes in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 68, 16 p., illus., **1970.** Representative chemical analyses and mineralogical descriptions of Triassic(?) diabase dikes are presented for 13 samples from south-central Pennsylvania and one sample from northern Maryland.
5. Native sulfur in Penna.: Pennsylvania Geology, v. 2, no. 1, p. 14–15, illus., **1971.** Six occurrences of native sulfur are reviewed briefly and two new localities, Chestnut Hill (Lancaster County) and Kehley's Run mine (Schuylkill County), are described.
6. Preserving Pennsylvania's fossil and mineral localities: Pennsylvania Geology, v. 2, no. 6, p. 10, illus., **1971.** An argument is presented for the preservation of collecting sites.
7. Trace elements in coal—potential economic sources and hazards: Pennsylvania Geology, v. 2, no. 6, p. 6–7, **1971.** Trace elements in coal may prove to be pollutants of air and water.
8. (and Barnes, J. H.). Unusual minerals found in Pennsylvania: Pennsylvania Geology, v. 2, no. 6, p. 2–3, illus., **1971.** Recent finds include huntite, penninite, zircon, fluorapatite, and magnetite from the Cedar Hill quarry, Lancaster County; erythrite and cobaltite from a quarry in Triassic rocks; and celestite, fluorite, calciostrontianite, calcite, dolomite, and rutile from the Showalter quarry, Lancaster County. Other unusual finds include chrysocolla, coffinite, chevkinite, magnetite, and pumpellyite.
9. (and Faill, R. T.). 230 million years of rock missing: Pennsylvania Geology, v. 2, no. 1, p. 5, illus., **1971.** At an exposure uncovered during highway construction east of Harrisburg, Dauphin County, a gap representing 230 million years exists between Paleozoic shales and limestones and Triassic rocks. Possible explanations are given.
10. (and Hoover, K. V.). Preliminary evaluation of the factors affecting the use potential of clays and shales in Pennsylvania: Society of Mining Engineers of AIME Transactions, v. 250, no. 4, p. 292–295, illus., **1971.** Three hundred ten samples

were analyzed during a testing program, which indicated considerable potential for the brick, tile, and lightweight aggregate industries.

11. (and Root, S. I.). Summary of isotopic age determinations in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 70, 29 p., illus., **1971.** The knowledge gained from isotopic age determinations aids in unravelling structural history, solving problems of stratigraphic correlation, and understanding the formation of many metallic and nonmetallic deposits.
12. Cornwall: the end of an era: Pennsylvania Geology, v. 3, no. 5, p. 2–9, illus., **1972.** The history and economic importance of the magnetite iron ore deposits are reviewed.
13. Gold in Pennsylvania's hills—and valleys: Pennsylvania Geology, v. 3, no. 2, p. 2–4, illus., **1972.** Traces of gold are found in the diabase rocks of Pennsylvania. Localities are listed for Berks, Bucks, Chester, Lancaster, Montgomery, and Philadelphia Counties.
14. The future of anthracite,—a possible solution to the sulfur problem: Pennsylvania Geology, v. 4, no. 6, p. 2–4, **1973.** Because the energy crisis increased the need for coal, the removal of sulfur will be important if the industry is going to expand.
15. (and Gray, Carlyle). Geology and origin of the Triassic magnetite deposit and diabase at Cornwall, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 56, 343 p., illus. including geologic map, **1973.** The report details the stratigraphy, petrology, mineralogy, geochemistry, and genesis of the ore bodies.
16. (and Smith, R. C., II, and Barnes, J. H.). Some possible minerals which might reasonably occur in Pennsylvania: Friends of Mineralogy, Region 3, Newsletter, p. 4–8, August **1973** [not seen].
17. Interpretation of K-Ar and Rb-Sr isotopic dates from a Precambrian basement core, Erie County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 79, 26 p., illus., **1975.** A well drilled near Lake Erie provided data used to describe previously inaccessible rock types. Included are petrographic descriptions, radiometric age dates, and a description of the complex events that affected the rocks.
18. Selenium in eastern Pennsylvania, a benefit or hazard?: Pennsylvania Geology, v. 6, no. 2, p. 13–16, illus., **1975.** The selenium content in burning anthracite culm banks in the anthracite region of eastern Pennsylvania and in the Susquehanna River at Marietta, Lancaster County, are higher than recorded elsewhere in Pennsylvania. The question is whether the environment is threatened.
19. The State Line district's many rock types: Pennsylvania Geology, v. 6, no. 5, p. 2–7, illus., **1975.** This part of Lancaster County may contain the greatest number of rock types in the state. More than 35 rock types have been recognized.

See also Barnes, John H., 1, 2; Bolles, William H., 3; Finkelman, Robert B., 1; Geyer, Alan R., 1, 5; Hoover, Karl V., 3.

LARDIERI, A. C., *see* Beall, Robert M., 2.

LARESE, R. E., *see* Heald, M. T., 1.

LaROCK, EDWARD J.

1. (compiler and ed.). The caves of Snyder County, Pennsylvania: National Speleological Society, Mid-Appalachian Region, Bulletin 10, 30 p., illus., **1976.** Twenty known caves are listed and described. Locations are plotted by latitude, longitude, and elevation from 7½-minute topographic maps. Maps for some caves are included in an appendix.

LARWOOD, GARY M., *see* Secor, Edwin S., 1.

LASH, GARY G.

1. The structure and stratigraphy of the Pen Argyl Member of the Martinsburg Formation in Lehigh and Berks Counties, Pennsylvania: Bethlehem, Pa., Lehigh University, M.S. thesis, **1978.**
2. The structure and stratigraphy of the Pen Argyl Member of the Martinsburg Formation in Lehigh and Berks Counties, Pennsylvania: U.S. Geological Survey Open-File Report 78-391, 225 p., illus. including geologic map, **1978** [not seen].

LATTMAN, LAURENCE H.

1. Geological instruction in remote sensing [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 6, p. 392, **1970.**
2. (and Matzke, R. H.). Fracture traces and joints in central Pennsylvania: American Association of Petroleum Geologists Bulletin, v. 55, no. 10, p. 1878–1881, illus., **1971.** Dominant trends of fracture traces in the northwestern part of the folded Appalachians are unaffected by local faulting or folding. Instead, the dominant trend changes direction and maintains a constant 52-degree angle with the regional structural trend. The authors conclude that in areas of strong folding, fracture traces and the vertical joint zones they represent are related to regional structural trends rather than to local structures.

LAUGINIGER, EDWARD M.

1. Eastern Pennsylvania's Paleozoic fossils: Earth Science, v. 32, no. 3, p. 101–104, illus., **1979.** Summary of a field trip to fossil-collecting sites in Lancaster and Lebanon Counties.
2. Stalking the elusive trilobite: Earth Science, v. 32, no. 4, p. 163–165, illus., **1979** [not seen].

LAVIN, PETER M.

1. (and Merkel, R. H., Alexander, S. S., and Greenfield, R. J.). New applications of geophysical methods to ground-water problems in Pennsylvania: Earth and Mineral Sciences, v. 41, no. 5, p. 33–37, illus., **1972.** The application of geophysics to areas of groundwater exploration, acid mine drainage, and groundwater pollution is emphasized.

See also Muller, Otto H., 1; Parrish, Jay B., 2; Rankin, William E., 1; Shaub, F. Jeanne, 2.

LEAF, C. GORDON

1. The mineral industry of Pennsylvania in 1969: Pennsylvania Geological Survey, 4th ser., Information Circular 71, 20 p., illus., **1971;** reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1969, v. 3, p. 633–652, illus., **1971.**

LEAVERS, D. R., *see* Masteller, E. C., 1.

LeCLAIR, L. D., *see* Muller, Otto H., 1.

LEE, PATTY P. F., *see* McKown, Mary M., 1.

LEES, ARTHUR S., *see* Secor, Edwin S., 1.

LEE-SIMPSON ASSOCIATES, INC.

1. Mine drainage abatement study, Upper Little Toby Creek watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 132-5,

103 p., illus., **1978.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

LEIGHTON, F. W.

1. (and Steblay, B. J.). Applications of microseismics in coal mines: Series on Rock and Soil Mechanics, v. 2, no. 3, p. 205-209, illus., **1977** [not seen].

LEMEZIS, SYLVESTER, *see* Maneval, David R., 2.

LENFEST, LESLIE W., JR., *see* Flippo, Herbert N., Jr., 2.

LEONARD, JAY E.

1. (and Keidel, S. J., Knapp, S. D., MacKenzie, K. R., and Cohn, B. P.). The rhythmic flooding of the Susquehanna River [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 73, **1978.**

LEOPOLD, LUNA B., *see* Miller, R. Adam, 1.

LESCINSKY, JOSEPH B., *see* Koester, Harry E., 1; Wood, Charles R., 1.

LESHENDOK, T. V., *see* Russell, O. R., 1.

LESURE, F. G.

1. (and Motooka, J. M., and Weis, P. L.). Exploration geochemical studies of some sandstone copper-uranium deposits, Bradford, Columbia, and Lycoming Counties, Pennsylvania: Journal of Research of the U.S. Geological Survey, v. 5, no. 5, p. 609-621, illus., **1977.** Analyses of sandstone, siltstone, and claystone from the Catskill Formation suggest that copper, silver, and uranium are the principal metallic elements concentrated in the mineralized rock.

LETTERMAN, RAYMOND D., *see* Mitsch, William J., 1, 2.

LEVINE, JEFFREY R.

1. (and Davis, Alan). Strain analysis of deformed strata in the Broad Top coal field, Pennsylvania using coal reflectance anisotropy [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 466, **1979.**

LEWIS, DALE M.

1. The use of lead-210 as a heavy metal tracer in the Susquehanna River system [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 7, p. 1168, **1975.**
2. The geochemistry of manganese, iron, uranium, lead-210 and major ions in the Susquehanna River: New Haven, Conn., Yale University, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 37, no. 6, p. 2718B, **1976.**
3. The use of ^{210}Pb as a heavy metal tracer in the Susquehanna River system: Geochimica et Cosmochimica Acta, v. 41, no. 11, p. 1557-1564, **1977.** Lead-210 and related data concerning soil, groundwater, and river water are presented, and the implications for heavy-metal mobility in soils and streams are discussed.

See also Nozaki, Y., 1.

LEWIS, RALPH S.

1. (and Thompson, P. R.). Geology of the Fruitville-Chestnut Ridge area, Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1970.**

2. An investigation of various aspects of lead contamination in soils contiguous to several highways near Lancaster, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, M.S. thesis, **1974.**

LIEBES, E.

1. (and MacDonald, W. D.). Paleomagnetism of uppermost Catskill rocks, northeast Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 294–295, **1977.**

LINDAHL, DAVID

1. The geology of the Brandy Camp quadrangle, Elk County, Pennsylvania: University of Pittsburgh, M.S. thesis, **1977.**

LINGER, DANIEL B.

1. Stratigraphic analysis of the lower Monongahela Groups [sic] coals and associated rocks (Pittsburgh-Redstone interval) in Marion and Monongalia Counties, West Virginia and Greene County, Pennsylvania, *in* Donaldson, A. C., and others, eds., Field trip guidebook for Carboniferous coal short course: West Virginia Geological and Economic Survey Bulletin B–37–2, p. 93–120, illus., **1979.** Parts of southern Greene County are included in this West Virginia study of the stratigraphy of the Pittsburgh to Redstone coal interval. Cross sections and isopach maps are shown.

See also Donaldson, Alan C., 3, 4.

LININGER, JAY L.

1. The native copper and piemontite localities of Adams County, Pennsylvania: Rocks and Minerals, v. 53, no. 3, p. 140–143, illus., **1978.** Current information is given on mineral collecting in Adams County. A list of 50 distinct species has been compiled.

LIPE, WILLIAM D., *see* Coates, Donald R., 2.

LIPSCOMB, G. H., *see* Cunningham, Robert L., 1.

LITHGOW, E. W.

1. An analysis of factors controlling the occurrence of bloating shales in the Pennsylvanian System of western Pennsylvania: University Park, Pennsylvania State University, M.S. paper, **1973.**

See also Williams, Eugene G., 4, 6.

LITTLE, MAYNARD

1. The geology of the Ephrata and Lititz lowlands, Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

LIUM, BRUCE W.

1. Limnological data for the major streams in Chester County, Pennsylvania: U.S. Geological Survey Open-File Report, Harrisburg, Pa., 219 p., illus., **1976.** Limnological data have been collected and tabulated to provide information on present stream conditions, in order to form a basis for comparison with future conditions as land use patterns change due to increasing urbanization.
2. Limnological studies of the major streams in Chester County, Pennsylvania: U.S. Geological Survey Open-File Report 77–462, 49 p., illus., **1977** [not seen].

LKB RESOURCES

1. NURE aerial gamma ray and magnetic reconnaissance survey—Thorpe area—Newark NK18–11 quadrangle—Volume I, Narrative report, *and* Volume II [Data]:

U.S. Department of Energy Report GJBX-16(78), v. 1, variously paginated, v. 2, unpaginated, illus., **1977.** Procedures used for the airborne survey are described, the geology of the area is discussed generally, and the data obtained are presented. It is concluded that the area is a uraniferous province, although possibly not economic.

2. NURE aerial gamma ray and magnetic reconnaissance survey—Thorpe area—Harrisburg NK18-10 quadrangle—Volume I, Narrative report, *and* Volume II [Data]: U.S. Department of Energy Report GJBX-33(78), v. 1, variously paginated, v. 2, unpaginated, illus., **1978.** Procedures used for the airborne survey are described, the geology of the area is discussed generally, and the data obtained are presented. It is concluded that the area is not a uraniferous province.
3. NURE aerial gamma ray and magnetic reconnaissance survey—Thorpe area—Scranton NK18-8 quadrangle—Volume I, Narrative report, *and* Volume II [Data]: U.S. Department of Energy Report GJBX-32(78), v. 1, variously paginated, v. 2, unpaginated, illus., **1978.** See annotation in entry 1 above.
4. NURE aerial gamma ray and magnetic reconnaissance survey—Thorpe area—Williamsport NK18-7 quadrangle—Volume I, Narrative report, *and* Volume II [Data]: U.S. Department of Energy Report GJBX-34(78), v. 1, variously paginated, v. 2, unpaginated, illus., **1978.** See annotation in entry 2 above.

LLOYD, ORVILLE B., JR.

1. (and Growitz, D. J., Wyrick, G. G., and Bain, G. L.). Results of ground magnetic surveys made over fracture traces in York County, Pennsylvania (prepared in cooperation with the Pennsylvania Geologic Survey), *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 108-112, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 108-112, illus., **1971.** Two of five test wells drilled on fracture traces in York County showed evidence of high permeability and fracturing. Magnetic contours were found to parallel the trend of the fracture trace at each of the productive well sites.
2. (and Growitz, D. J.). Ground water resources of central and southern York County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 42, 93 p., illus. including geologic map, **1977.** The significance, availability, and quality of groundwater in the major bedrock formations are evaluated.

See also Carswell, Louis D., 1, 2; Growitz, Douglas J., 1.

LOBDELL, L. W., *see* Thiers, G. R., 1.

LOFERSKI, P. J., *see* Hosterman, John W., 4.

LONG, RICHARD S.

1. Soil survey of Franklin County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 122 p., illus. including soils maps, **1975.** Written descriptions of the soils, as well as soils maps, are included.

LONG, S. B., *see* Hamel, James V., 3.

LORENZ, DOUGLAS M.

1. Integrated basin analysis of the Dunkard Group (Late Pennsylvanian) in Ohio, West Virginia and Pennsylvania: Oxford, Ohio, Miami University, M.S. thesis, **1971.**

2. (and Martin, W. D.). Quantitative basin analysis of Permo-Carboniferous Dunkard Group in Ohio, Pennsylvania, and West Virginia [abs.]: American Association of Petroleum Geologists Bulletin, v. 55, no. 2, p. 349, **1971.**

LORENZ, WALTER C.

1. Coal—Pennsylvania anthracite, *in* Metals, minerals, and fuels: U.S. Bureau of Mines Minerals Yearbook 1969, v. 1-2, p. 371-395, illus., **1971.** Detailed account of anthracite production and distribution in 1969. Total production was almost 10.5 million short tons.

LORING, RICHARD B., *see* Platt, Lucian B., 1.

LOVE, DAVID A., *see* Herbstritt, James T., 1.

LOVE, GEORGE E. W., JR.

1. Some engineering geologic problems of reservoir siting in Pennsylvanian sedimentary terrains [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 90, **1975.**

LOVE, JOHN E.

1. A multivariate analysis of lithologic coloration within the Catskill Formation: University Park, Pennsylvania State University, M.S. thesis, **1977.**

LOVEGREEN, JON R.

1. (and Prosser, W. J., and Millet, R. A.). Geologic analyses of Landsat-1 multispectral imagery of a possible power plant site employing digital and analog image processing, *in* Proceedings of the NASA Earth Resources Survey Symposium [Houston, Tex., 1975], Volume I-B, Technical sessions presentations—Geology—information systems and services: U.S. National Aeronautics and Space Administration Technical Memorandum X-58168, p. 1293-1308, illus., **1975.** Image processing can be used as a cost-effective tool for identifying linears and rock outcrops in areas of heavy vegetative cover, but is not a complete replacement for standard manual interpretation.

LOVELL, HAROLD L.

1. Coal mine drainage pollution, 1973: Earth and Mineral Sciences, v. 42, no. 7, p. 54-55, **1973** [not seen].
2. (and Gunnett, J. W.). Hydrogeological influences in preventive control of mine drainage from deep coal mining: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report SR-100, 89 p., illus., **1974.** A well-documented study of a mine drainage problem in Clearfield County. Groundwater infiltration is primarily found to occur in caved areas, and along joints associated with surface fracture traces in uncaved areas. Recommendations to reduce infiltration are discussed.

See also Lachman, R. I., 1.

LOWE, RODGER, *see* Hanson, Henry, 1.

LOWRIGHT, RICHARD H.

1. (and Williams, E. G.). Light and heavy mineral settling velocity distributions in sands along southern Lake Erie [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 27-28, **1970.**
2. An analysis of factors controlling deviations in hydraulic equivalence in some modern sands: University Park, Pennsylvania State University, Ph.D. thesis, **1971**; [abs.], Dissertation Abstracts International, v. 32, no. 5, p. 2798B, **1971.**

3. (and Williams, E. G., and Dachille, Frank). An analysis of factors controlling deviations in hydraulic equivalence in some modern sands: Journal of Sedimentary Petrology, v. 42, no. 3, p. 635–645, illus., **1972.** In studying the sedimentary system on the southern shore of Lake Erie, an attempt was made to resolve the problem of "source" versus "process" as a control of heavy and light mineral size distribution in sands.
4. Environmental determination using hydraulic equivalence studies: Journal of Sedimentary Petrology, v. 43, no. 4, p. 1143–1147, illus., **1973.** Samples were collected from the same stratigraphic unit throughout the southern Lake Erie shoreline. These samples were analyzed and the depositional environment determined.
5. Climatic cause of variation in hydraulic equivalence [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 90–91, **1975.**

LUCE, R.

1. (and Schmidt, V. A.). Clastic sediments from Mammoth Cave, Ky., and from Meadowcroft Rockshelter, Pa., as recorders of paleosecular variation [abs.]: EOS (American Geophysical Union Transactions), v. 58, no. 12, p. 1125, **1977.**

LUCKIE, PETER T.

1. Operation Anthracite Refuse: Earth and Mineral Sciences, v. 39, no. 3, p. 20–21, illus., **1969** [not seen].

LUCOSTIC, C. M., *see* Moon, T. C., 1.

LUDWIG, KENNETH R., *see* Grauch, Richard I., 1.

LUKERT, MICHAEL T.

1. (and Ward, A. N., Jr.). A user's guide to the engineering characteristics of bedrock map of the Oil City 7½-minute quadrangle, Venango County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Open-File Report, **1976.** This guide and the accompanying engineering characteristics map illustrate numerous factors that can be used to interpret the major engineering character of the bedrock, including structure contours, fracture traces, and strike and dip.

See also Craft, Jesse L., 6; Ward, Albert N., Jr., 2, 3.

LUND, RICHARD

1. Fossil fishes from southwestern Pennsylvania—Part I: Fishes from the Duquesne Limestones (Conemaugh, Pennsylvanian): Carnegie Museum Annals, v. 41, article 8, p. 231–261, illus., **1970.** A few freshwater fossil fish from the Duquesne clay and limestone beds situated in the lower part of the Casselman Formation of the Conemaugh Group and found in the Pittsburgh area are described in detail.
2. Fossil vertebrates from the Pittsburgh area, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 80–83, illus., **1970.** Vertebrate fossil remains found in the vicinity of Pittsburgh are described. Stratigraphic position, a general reference to geographic location, and some illustrations of these fossils are provided.
3. Vertebrate fossils from the Washington Stone Company quarry, Vance, Pa., *in* Arkle, Thomas, Jr., field trip director, I. C. White Memorial Symposium field trip, log of trip, September 27, 28, 29, 1972: West Virginia Geological and Economic Survey, p. 56–58, **1972.** Disarticulated vertebrate fossils of various species of shark, lungfish, fish, and amphibia occur in the Upper Washington limestone and Greene Formation in Washington County.

4. Fossil fishes from southwestern Pennsylvania, Part II: *Monongahela dunkardensis,* new species, (Dipnoi, Lepidosirenidae) from the Dunkard Group: Carnegie Museum Annals, v. 44, article 7, p. 71–101, illus., **1973.** A description is given of lungfish fossils found in the freshwater limestones of Late Pennsylvanian and Early Permian age of southwestern Pennsylvania. Jaw remains of the species *Monongahela dunkardensis* were found in very high concentrations in the Washington and Greene Formations, enabling intensive statistical investigation into evolutionary trends within the species and into the details of species formation in the genus *Monongahela.*

See also Wagner, Walter R., 6.

LUND, S. P., *see* King, John, 1.

LUNDEGARD, PAUL D.

1. (and Samuels, N. D., and Pryor, W. A.). The Brallier Formation—Upper Devonian turbidite slope facies of the central and southern Appalachians, *in* Preprints—Second Eastern Gas Shales Symposium [Morgantown, W. Va., 1978]: U.S. Department of Energy Report METC/SP-78/6, v. 1, p. 4–23, illus., **1978.** A discussion of the stratigraphy, petrography, and potential hydrocarbon reserves of the Brallier Formation.

LUTZ-GARIHAN, ANNE B.

1. The influence of geologic and geomorphic parameters on the flood response of small drainage basins in Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 223, **1976.**

See also Cuffey, Roger J., 1, 2; Garihan, A. L.

LYNN, JEFFREY S.

1. The heavy mineral barite of the Dunkard Group (Upper Carboniferous) in Pennsylvania, Ohio, and West Virginia: Oxford, Ohio, Miami University, M.S. thesis, **1975.**

LYSTROM, DAVID J.

1. (and Rinella, F. A., and Knox, W. D.). Definition of regional relationships between dissolved solids and specific conductance, Susquehanna River basin, Pennsylvania and New York: Journal of Research of the U.S. Geological Survey, v. 6, no. 4, p. 541–545, illus., **1978.** Based on statistical tests, it was concluded that regional models could be used to estimate dissolved-solids concentrations from specific-conductance data.
2. (and Rinella, F. A., Rickert, D. A., and Zimmermann, Lisa). Multiple regression modeling approach for regional water quality management: U.S. Environmental Protection Agency Report EPA-600/7-78-198, 60 p., illus., **1978.** Eighty subbasins of the Susquehanna River basin in Pennsylvania and New York were evaluated for spatial variation of water quality using 17 characteristics of sediment, dissolved solids, and chemicals.
3. (and Rinella, F. A., Rickert, D. A., and Zimmermann, Lisa). Regional analysis of the effects of land use on stream-water quality, methodology and application in the Susquehanna River basin, Pennsylvania and New York: U.S. Geological Survey Water-Resources Investigations 78–12, 60 p., illus., **1978** [not seen].

LYTLE, VIRGINIA

1. (and Lytle, William). But is there really a Slippery Rock?: Pennsylvania Geology, v. 5, no. 1, p. 4–8, **1974.** The authors located Slippery Rock from an 1864 map by J. P. Lesley. The history of the rock is discussed.

2. Oil spoiled the salt: Pennsylvania Geology, v. 7, no. 3, p. 12–13, **1976.** The earliest recorded petroleum discovery in Butler County occurred in 1810 when a well that was dug to increase the supply of salt water at Kearns Crossing produced oil as well as salt water.

LYTLE, WILLIAM S.

1. Moraine State Park [Butler County]: Pennsylvania Geological Survey, 4th ser., Park Guide 4, illus., pamphlet **[1970].** The glacial features of the park include Lake Arthur, Lake Edmund, and the eskers and kettle holes.
2. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1969]: American Association of Petroleum Geologists Bulletin, v. 54, no. 6, p. 941–947, illus., **1970.**
3. (and Goth, J. H.). Oil and gas geology of the Kinzua quadrangle, Warren and McKean Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 62, 99 p., illus., **1970.** The quadrangle has 28 known oil and/or gas fields. The most productive sands are in the Canadaway Group (Upper Devonian). Appendices contain selected shallow- and deep-well records.
4. Landslides and rock falls, Pittsburgh area: Pennsylvania Geology, v. 2, no. 6, p. 4, illus., **1971.** To anticipate and prevent these geologic hazards, an understanding of the geology of the area is necessary.
5. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1970]: American Association of Petroleum Geologists Bulletin, v. 55, no. 7, p. 1080–1089, illus., **1971.**
6. (and Heyman, Louis, and Kelley, D. R.). Oil and gas developments in Pennsylvania in 1970: Pennsylvania Geological Survey, 4th ser., Progress Report 183, 50 p., illus., **1971;** International Oil Scouts and Landsmen's Association Yearbook 1970, v. 41, pt. 1, p. 221–225, pt. 2, p. 385–386, **1971.**
7. (and Heyman, Louis, Kelley, D. R., and Wagner, W. R.). Future petroleum potential of western and central Pennsylvania, *in* Cram, I. H., ed., Future petroleum provinces of the United States—their geology and potential: American Association of Petroleum Geologists Memoir 15, v. 2, p. 1232–1242, illus., **1971.** The Appalachian basin can still be considered one of the major domestic areas that has significant potential for new petroleum reserves. The availability of this petroleum is examined.
8. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1971]: American Association of Petroleum Geologists Bulletin, v. 56, no. 7, p. 1310–1311, **1972.**
9. Pennsylvania's booming oil and gas search: Pennsylvania Geology, v. 3, no. 3, p. 2–3, illus., **1972.** The scarcity of fuels has caused an increase in exploration in northwestern Pennsylvania.
10. (and Heyman, Louis). Oil and gas developments in Pennsylvania in 1971: Pennsylvania Geological Survey, 4th ser., Progress Report 184, 39 p., illus., **1972;** International Oil Scouts and Landsmen's Association Yearbook 1971, v. 42, pt. 1, p. 232–234, pt. 2, p. 367–368, **1972.**
11. Oil and gas developments in Pennsylvania in 1972: Pennsylvania Geological Survey, 4th ser., Progress Report 186, 36 p., illus., **1973;** International Oil Scouts and Landsmen's Association Yearbook 1972, v. 43, pt. 1, p. 241–245, pt. 2, p. 355–356, **1973.**
12. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1972]: American Association of Petroleum Geologists Bulletin, v. 57, no. 8, p. 1549–1551, 1558–1561, 1569, illus., **1973.**

13. Petroleum in Pennsylvania: Pennsylvania Geology, v. 4, no. 1, p. 15–16, **1973.** Review of petroleum exploration and developments in Pennsylvania in 1972.
14. Increased oil and gas exploration in Pennsylvania: Pennsylvania Geology, v. 5, no. 1, p. 2–3, illus., **1974.** Summary of the exploration effort in western Pennsylvania during 1973.
15. Oil and gas developments in Pennsylvania in 1973: Pennsylvania Geological Survey, 4th ser., Progress Report 187, 44 p., illus., **1974;** International Oil Scouts and Landsmen's Association Yearbook 1973, v. 44, pt. 1, p. 247–253, pt. 2, p. 394–395, **1974.**
16. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1973]: American Association of Petroleum Geologists Bulletin, v. 58, no. 8, p. 1640–1643, 1651–1655, 1660, illus., **1974.**
17. Oil and gas developments in Pennsylvania in 1974: Pennsylvania Geological Survey, 4th ser., Progress Report 188, 38 p., illus., **1975;** International Oil Scouts and Landsmen's Association Yearbook 1974, v. 45, pt. 1, p. 247–254, pt. 2, p. 396–397, **1975.**
18. Oil and gas, Pennsylvania 1975: Pennsylvania Geology, v. 6, no. 6, p. 9–10, **1975.** New discoveries are summarized.
19. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1974]: American Association of Petroleum Geologists Bulletin, v. 59, no. 8, p. 1439–1441, 1452–1455, 1466, illus., **1975.**
20. (and Balogh, L.). Greater Pittsburgh Region oil and gas fields map: Pennsylvania Geological Survey, 4th ser., Map 44, scale 1:125,000, **1975.** Two hundred forty-five named oil and gas fields and pools are depicted.
21. Oil fields of the Greater Pittsburgh Region: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 70, 119 p., illus., **1976.** The production history of each county for each year of record is provided, along with the geological and historical records for each of the 92 oil fields of the area.
22. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1975]: American Association of Petroleum Geologists Bulletin, v. 60, no. 8, p. 1289–1291, 1303–1308, 1318, illus., **1976.**
23. The story of the Drake well, *in* Ward, A. N., Jr., and others, Bedrock and glacial geology of northwestern Pennsylvania in Crawford, Forest and Venango Counties: Annual Field Conference of Pennsylvania Geologists, 41st, Titusville, Pa., Guidebook, p. 33–38, illus., **1976.** An account of the start of petroleum companies, the background of Edwin Drake, drilling of the first oil well at Titusville, and subsequent development of a park and museum.
24. (and Piotrowski, R. G.). Oil and gas developments in Pennsylvania in 1975: Pennsylvania Geological Survey, 4th ser., Progress Report 189, 41 p., illus., **1976;** International Oil Scouts and Landsmen's Association Yearbook 1975, v. 46, pt. 1, p. 268–274, pt. 2, p. 444–445, **1976.**
25. Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia [in 1976]: American Association of Petroleum Geologists Bulletin, v. 61, no. 8, p. 1270–1272, 1285–1291, 1301, illus., **1977.**
26. (and Balogh, L. J., compilers). Maps of the oil and gas fields, natural gas pipelines, and oil pipelines of Pennsylvania: Pennsylvania Geological Survey, 4th ser., Map 3, scale 1:250,000, **1977.** The location and boundaries of Pennsylvania's 811

oil and gas fields are shown. On the reverse side are maps of principal crude oil and product pipelines and principal natural gas pipelines (scale 1:500,000).

27. (and Heyman, Louis, Piotrowski, R. G., and Krajewski, S. A.). Oil and gas developments in Pennsylvania in 1976: Pennsylvania Geological Survey, 4th ser., Progress Report 190, 49 p., illus., **1977**; International Oil Scouts and Landsmen's Association Yearbook 1976, v. 47, pt. 1, p. 268–274, pt. 2, p. 444–445, **1977.**

See also Kelley, D. R., 3, 4; Lytle, Virginia, 1; Wagner, Walter R., 8, 12.

LYTTLE, PETER T.

1. Tectonic history of the Shochary Ridge region, eastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 22, **43, 1979.**
2. (and Drake, A. A., Jr.). Discussion—Regional implications of the stratigraphy and structure of Shochary Ridge, Berks and Lehigh Counties, Pennsylvania: American Journal of Science, v. 279, no. 6, p. 721–728, illus., **1979.**

See also Drake, Avery A., Jr., 3.

MABRY, RICHARD E.

1. An evaluation of mine subsidence potential, *in* New horizons in rock mechanics; Underground design and instrumentation: Symposium on Rock Mechanics, 14th, Proceedings, p. 263–297, illus., **1973** [not seen].

MacDONALD, W. D., *see* Liebes, E., 1.

MacKALLOR, JULES A.

1. (and Schenck, G. H. K.). The assessment of mineral lands in Pennsylvania: Pennsylvania State University, College of Earth and Mineral Sciences Special Report 70–2, 46 p., illus. **[1970].** A statewide study of property tax and assessment policies of nonproductive mineral lands. Policies that promote or hinder mineral development are identified.

MacKENZIE, KEVIN R.

1. The rhythm of flooding of the Susquehanna River: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1978.**

See also Leonard, Jay E., 1.

MACKIEWICZ, MICHAEL C.

1. Pennsylvania's coal and fossils: Earth Science, v. 29, no. 4, p. 74–75, illus., **1976.** Two collecting localities, near Frackville and St. Clair, Schuylkill County, are described.

MacLACHLAN, DAVID B.

1. Limestone fights air pollution: Pennsylvania Geology, v. 1, no. 9, p. 15, **1970.** Studies indicate that ground limestone used in coal-fired electric plants may permit the use of high-sulfur fuel without air pollution from sulfur oxides.
2. (and Buckwalter, T. V., and McLaughlin, D. B.). Geology and mineral resources of the Sinking Spring quadrangle, Berks and Lancaster Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 177d, 228 p., illus. including geologic map, **1975.** Deals with the distribution, composition, geologic history, structures, and economic potential of the bedrock units and unconsolidated sediments of one of the most geologically complex areas in the eastern United States.

3. (and Root, S. I.). Detailed structural geology, *in* Root, S. I., Geology and mineral resources of the Harrisburg West area, Cumberland and York Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 148ab, p. 88–97, illus., **1977.** The Yellow Breeches klippe and folds in the Martinsburg Formation are outlined in charts and written text.
4. Geology and mineral resources of the Temple and Fleetwood quadrangles, Berks County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 187ab, 71 p., illus. including geologic map, **1979.** The complex structures and rock types of the Great Valley and Reading Prong are examined through detailed maps and text.
5. Major structures of the Pennsylvania Great Valley and the new geologic map of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 43, **1979.**

See also Root, Samuel I., 15; Wood, Charles R., 2.

MacNAMARA, E. E., *see* Palmer, John K., 1.

MAGNUSON, M. O.

1. Control of fires in abandoned mines in the eastern bituminous region of the United States—A supplement to Bulletin 590: U.S. Bureau of Mines Information Circular 8620, 53 p., illus., **1974** [not seen].

MAHAR, DENNIS L.

1. Geology and geochemistry of uranium deposits near Beaver Lake, Sullivan County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1978.**

See also Rose, Arthur W., 12.

MAHONEY, J. W., JR., *see* Hofmann, A. W., 1.

MAHTAB, M. A., *see* Bolstad, D. D., 1.

MAIN, LINDA D.

1. What starts a coal mine fire?: Pennsylvania Geology, v. 4, no. 6, p. 7–9, illus., **1973.** The causes, problems associated with, and programs designed to extinguish mine fires are discussed very generally.
2. A structural interpretation of the Cove fault and petrofabric study of the Tuscarora Sandstone, Fulton County, Pennsylvania: Norman, University of Oklahoma, M.S. thesis, **1978.**

MAKURATH, JOSEPH H.

1. Paleoecology and evolutionary trends in gypidulid brachiopods: Philadelphia, Temple University, M.S. thesis, **1972.**
2. (and Anderson, E. J.). Gypidulid brachiopods: their life position and paleoenvironment [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 3, p. 637, **1972;** [abs.], Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 29, **1972.**
3. The sedimentology and paleoecology of the Keyser Limestone (Upper Silurian-Lower Devonian) of the central Appalachians: Baltimore, Johns Hopkins University, Ph.D. thesis, **1975.**
4. Appalachian marine faunal assemblages: an environmental approach [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 4, p. 491, **1976.**
5. Marine faunal assemblages in the Silurian-Devonian Keyser Limestone of the central Appalachians: Lethaia, v. 10, no. 3, p. 235–256, illus., **1977.** Sedimentological analysis of the Keyser Limestone indicated that its sediments were deposited in a range of marginal and shallow marine environments.

MANEVAL, DAVID R.

1. Pennsylvania cleans up its anthracite fields: Mining Engineering, v. 23, no. 6, p. 57–60, illus., **1971.** Growing state and federal concern has been directed toward reclamation of damaged land.
2. (and Lemezis, Sylvester). Multistage flash evaporation system for the purification of acid mine drainage: Society of Mining Engineers of AIME Transactions, v. 252, p. 42–45, **1972.** All acid mine waters cannot be treated by a single method. Flash evaporation was used for a large outfall near Wilkes-Barre, Luzerne County.

MANNS, FRANCIS T.

1. (and Goodwin, P. W.). Algal mounds in the upper Stonehenge Formation of the Beekmantown Group (Lower Ordovician) of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 29, **1972.**
2. Genesis and environmental position of the algal mounds of the Stonehenge Formation: Philadelphia, Temple University, M.S. thesis, **1973.**

MARANO, DAVID, *see* Wilson, Stanley D., 1, 2.

MARCHAND, DENIS E.

1. Pleistocene history of the central Susquehanna Valley—a preliminary report [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 194, **1973.**
2. Preliminary surficial geologic maps showing Quaternary deposits in parts of Union and Snyder Counties, central Pennsylvania: U.S. Geological Survey Open-File Report 78–1025, 6 p., 14 pls., scale 1:24,000, **1978** [not seen].

MARCHAND, MAURA O.

1. A system of quantitative landscape evaluation [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 50–51, **1974.**

MARK, LAWRENCE E.

1. Petrology and metamorphism in the Marcus Hook quadrangle, southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, M.S. thesis, **1977.**

See also Crawford, Maria L., 4.

MARSHALL, SYDNE B., *see* McNett, Charles W., Jr., 1.

A. W. MARTIN ASSOCIATES, INC.

1. Little Schuylkill River basin mine drainage study: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 167, 89 p., variously paginated appendices, illus., **1973.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. Relationship between underground mine water pools and subsidence in the northeastern Pennsylvania anthracite fields: Appalachian Regional Commission Report ARC-73-111-2553, 130 p., variously paginated appendices, illus., **1975.** Analysis of mine subsidence indicates that, 93 percent of the time, peak precipitation precedes peak subsidence, inducing gravity failure in naturally weak or mined areas. Control measures are discussed, and four appendices itemize utilized data.

MARTIN, E. C., *see* Speer, J. Alexander, 1.

MARTIN, GEORGE D.

1. Soil survey of Armstrong County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 73 p., illus. including soils maps, **1977.** Written descriptions of the soils as well as soil-association maps are included.

MARTIN, JOHN D., *see* Bitler, John R., 1.

MARTIN, MARY M.

1. Comparison of water quality from three surface coal mine spoils with different type and age of restoration, Clarion County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1979.**

MARTIN, RICHARD A.

1. Geology of Devil's Racecourse boulderfield, Dauphin County, Pennsylvania: Millersville, Pa., Millersville State College, M.Ed. thesis, **1971.**
2. Geology of the Devil's Racecourse boulderfield, Dauphin County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 30–31, **1972.**

MARTIN, WAYNE D.

1. (and Henniger, B. R.). [Sandstone distribution in lower member of Waynesburg Formation, Greene and Washington Counties, southwest Pennsylvania]: Reply: American Association of Petroleum Geologists Bulletin, v. 54, no. 3, p. 535, **1970.**

See also Lorenz, Douglas M., 2.

MARTINO, RONALD L.

1. Stratigraphy, sedimentology, and depositional history of the Middle Devonian Mahantango Formation, south-central Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1973.**

MARVIN, J., *see* King, John, 1.

MASTELLER, E. C.

1. (and Cunningham, H. N., Jr., Leavers, D. R., and Tucker, E., Jr.). Biological, chemical and geological characteristics during August–September of Lake Erie tributaries of Erie County, Pa.: Pennsylvania Academy of Science Proceedings, v. 50, no. 1, p. 45–58, illus., **1976.** Twelve streams were examined at 58 sites to investigate possible relationships and correlations between the biological, chemical, and geological characteristics of Lake Erie tributaries.

MATELSKI, R. P., *see* Ciolkosz, Edward J., 3; Cunningham, Robert L., 1; Palkovics, W. E., 1; Petersen, Gary W., 1; Ranney, Richard W., 1, 2.

MATHEW, DAVID

1. (and Pedlow, G. W., III). Advances in geologic interpretation of geophysical borehole logs, Appalachian coal region [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 451, **1978.**

See also Ferm, John C., 7; Pedlow, George W., III, 2.

MATHEWS, H. L.

1. (and Cunningham, R. L., Cipra, J. E., and West, T. R.). Application of multispectral remote sensing to soil survey research in southeastern Pennsylvania: Soil Science Society of America Proceedings, v. 37, no. 1, p. 88–93, illus., **1973.** Sur-

face reflectance properties of nonvegetated fields were classified, and computer printout maps of soil spectral classes were compared with field conditions. Rock types and erosion classes were well differentiated by the method.

2. (and Cunningham, R. L., and Petersen, G. W.). Spectral reflectance of selected Pennsylvania soils: Soil Science Society of America Proceedings, v. 37, no. 3, p. 421–424, illus., **1973.** Spectral reflectance curves of selected soil characterization samples and standard clay minerals were studied over the wavelength interval 0.5 to 2.6 μm. Results reported include reflectance data from three Hagerstown profiles and the Ap horizons of Berks, Penn, and Ellery profiles.

MATTEI, C. M., *see* El-Ashry, M. T., 5.

MATZKE, RICHARD H., *see* Lattman, Laurence H., 2.

MAVRAGANIS, TED

1. Genesis of a late Wisconsinan kame-delta near Sciota [Monroe County], northeastern Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1975.**

MAY, G. A.

1. (and Petersen, G. W.). Spectral signature selection for mapping unvegetated soils: Remote Sensing of Environment, v. 4, no. 3, p. 211–220, illus., **1975.**

MAYNARD, BERNARD R.

1. (and Humbertson, P. G.). Some jointing and stream pattern relationships in southwestern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 93–94, **1975.**

MAYNARD, R. BERNARD

1. Stream entrenchment in Pleistocene lake terraces and its relationship to beach ridges of Lake Erie's south shore [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 75, **1978.**

McCABE, W. MARTIN

1. (and Koerner, R. M.). High pressure shear strength investigation of an anisotropic mica schist rock: International Journal of Rock Mechanics and Mining Sciences, v. 12, no. 8, p. 219–228, illus., **1975.** Mica schist from the Wissahickon Formation was tested for tension and compression in order to investigate the nature, causes, and effects of friction and intrinsic shear strength and their relationship to the compressive strength of this metamorphic rock.

McCARREN, EDWARD F.

1. Water quality of streams in the Neshaminy Creek basin, Pennsylvania: U.S. Geological Survey Water-Supply Paper 1999-O, p. O1–O33, illus., **1972.** The chemical composition of the water is described and records of stream discharge in the basin are presented. The factors that cause changes in the stream quality are discussed.

McCASLIN, JOHN C.

1. Oil's birthplace becomes prime wildcat area: Oil and Gas Journal, v. 71, no. 6, p. 87, illus., **1973.** The future potential for oil and gas in Pennsylvania's Appalachian Plateaus province is outlined.
2. Pennsylvania on aggressive wildcat campaign: Oil and Gas Journal, v. 71, no. 13, p. 151, **1973.** Summary of four successful gas discoveries in western Pennsylvania, two in Indiana County, and one each in Erie and Venango Counties.

3. Appalachian basin welcomes remote gas find: Oil and Gas Journal, v. 75, no. 52, p. 77, illus., **1977** [not seen].
4. Oil's birthplace due new drilling program: Oil and Gas Journal, v. 75, no. 29, p. 99, illus., **1977.** Summary of a two-year drilling program in southwestern Pennsylvania.
5. Central Pennsylvania: new wildcat theatre: Oil and Gas Journal, v. 76, no. 30, p. 79, illus., **1978.** Summary of a successful exploratory drilling program.
6. Pennsylvania's Devonian shale gets new look: Oil and Gas Journal, v. 76, no. 28, p. 175, illus., **1978.** The importance of the Devonian black shale in northwestern Pennsylvania to the oil industry is reviewed.
7. Central, southwest Pennsylvania get new look: Oil and Gas Journal, v. 77, no. 3, p. 143, illus., **1979.** Successful wells in Centre and Fayette Counties renewed interest in Pennsylvania as a major energy producer.
8. Deep Appalachian basin still draws interest: Oil and Gas Journal, v. 77, no. 48, p. 93, illus., **1979.** New discovery wells in the Oriskany are announced in Fayette and Somerset Counties. A deep test well is being drilled near Shamokin, Northumberland County.
9. Pennsylvania gas potential seen excellent: Oil and Gas Journal, v. 77, no. 30, p. 75, illus., **1979.** Successful exploration activities in 1977 and 1978 led to continued drilling in western Pennsylvania. A well location map is included.

McCONNELL, JAMES F.

1. Multi-stream coal cleaning strategy for control of sulfur oxide emissions at the Homer City generating station [Indiana County], *in* Smith, C. J., and Nichols, D. G., compilers, Proceedings of the Coal Processing and Conversion Symposium [Morgantown, W. Va., 1976]: West Virginia Geological and Economic Survey Coal Geology Bulletin CGB-6, p. 32–47, illus., **1979.** A summary of the crushing and washing process aimed at removing the maximum amount of pyritic sulfur at a mine-mouth electric plant. Suggestions are made for further research.

McCULLOCH, CHARLES M.

1. (and Deul, Maurice). Geologic factors causing roof instability and methane emission problems—The Lower Kittanning coalbed, Cambria County, Pa.: U.S. Bureau of Mines Report of Investigations 7769, 25 p., illus., **1973;** reprinted *in* Root, S. I., compiler, Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey, 4th ser., Information Circular 84, p. 65–93, illus., **1979.** Areas of high methane emission and roof instability were related to structural and stratigraphic features that characterize the geologic setting of two mines in Cambria County.
2. (and Deul, Maurice, and Jeran, P. W.). Cleat in bituminous coalbeds: U.S. Bureau of Mines Report of Investigations 7910, 25 p., illus., **1974.** Cleat (or joint) orientation measurements were taken in coals from five Pittsburgh coal mines in Washington and Greene Counties and from one Lower Kittanning coal mine in Cambria County. Cleat orientation was found to be related to the direction of the local fold axis, and directional permeability affecting the flow of water and methane was found to be directly related to cleat.
3. (and Diamond, W. P., Bench, B. M., and Deul, Maurice). Selected geologic factors affecting mining of the Pittsburgh coalbed: U.S. Bureau of Mines Report of Investigations 8093, 72 p., illus., **1975;** reprinted *in* Root, S. I., compiler, Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey, 4th ser., Information Circular 84, p. 147–202, illus., **1979.** Geologic factors affecting the mining of the Pittsburgh

coal in Washington and Greene Counties, including structure, overburden, relation of joints and linears, and cleat orientation, are reviewed.

4. (and Jeran, P. W., and Sullivan, C. D.). Geologic investigations of underground coal mining problems: U.S. Bureau of Mines Report of Investigations 8022, 30 p., illus., 1975; reprinted *in* Root, S. I., compiler, Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey, 4th ser., Information Circular 84, p. 113–146, illus., **1979.** The author discusses the advantages of geologic maps and fence diagrams in coal mining and how the knowledge gained from such geologic investigations can help control underground problems. The Pittsburgh coal bed in Greene and Washington Counties was used for the study.
5. (and Lambert, S. W., and White, J. R.). Determining cleat orientation of deeper coalbeds from overlying coals: U.S. Bureau of Mines Report of Investigations 8116, 19 p., illus., **1976.** Examination of several coal beds in Alabama, West Virginia, and Greene and Fayette Counties, Pennsylvania, indicated that cleat orientations are similar throughout a vertical sequence of strata.

See also Bench, Bernard M., 1; Diamond, W. Patrick, 1, 2.

McDONALD/PHILLIPS ENGINEERS, INC.

1. Mine drainage abatement project, Tanoma complex (Upper Crooked Creek), Indiana County: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 107-6, 32 p., variously paginated appendices, illus., **1972.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

McDONALD, R.

1. The Springfield Granodiorite; a reexamination: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1978.**

McDUFFIE, BRUCE

1. (and El-Barbary, Ibrahim, Hollod, G. J., and Tiberio, R. D.). Heavy metals in Susquehanna River bottom sediments—surficial concentrations, urban impacts, and transport mechanisms, *in* Hutzinger, O., and others, eds., Aquatic pollutants: transformation and biological effects: International Symposium on Aquatic Pollutants, 2nd, Amsterdam, Netherlands, 1977, Proceedings, p. 467–469, illus., **1978.** The impact of urban pollution from the Binghamton, New York, area is demonstrated by higher values for cadmium, chromium, copper, and mercury in downstream samples of surficial bottom sediments. The consistency of the size fraction ratios suggests that cation exchange equilibria influence the distribution.

McGLADE, WILLIAM G.

1. Environmental study of the Harrisburg area: Pennsylvania Geology, v. 1, no. 9, p. 2–5, illus., **1970.** The Pennsylvania Survey initiated an environmental study for the 325-square-mile area surrounding Harrisburg (chiefly Dauphin, Cumberland, and York Counties). The study includes four major parts—basic geology, groundwater resources, mineral resources, and engineering geology.
2. (and Wilshusen, J. P., and Geyer, A. R.). Engineering characteristics of the rocks of Pennsylvania [abs.]: Association of Engineering Geologists, Annual Meeting, Program and Abstracts, p. 18, **1970.**
3. Leonard Harrison and Colton Point State Parks—The Grand Canyon of Pennsylvania [Tioga County]: Pennsylvania Geological Survey, 4th ser., Park Guide

5, pamphlet, illus. [1971]. A description of the park's origin, scenic attractions, overlooks, and paths.
4. Plenty of rain—quick freeze—and you can see sinkholes: Pennsylvania Geology, v. 2, no. 3, p. 3–5, illus., 1971. Sinkholes can be identified by the formation of ice along their rims in freezing weather.
5. (and Geyer, A. R., and Wilshusen, J. P.). Engineering characteristics of the rocks of Pennsylvania: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 1, 200 p., illus., 1972. Important engineering, hydrologic, and basic geologic characteristics of rock formations in Pennsylvania are outlined.
6. (and Geyer, A. R.). Environmental geology of the greater Harrisburg metropolitan area: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 4, 42 p., illus. including geologic map, 1976. In this report, which covers the area from Mechanicsburg to Hershey, the critical environmental concerns of slope drainage, flood-prone areas, soils, groundwater, and geology and mineral resources are emphasized.

See also Geyer, Alan R., 7; Kelley, Dana R., 1.

McGREEVY, LAURENCE J.

1. (and Sloto, R. A.). Selected hydrologic data, Chester County, Pennsylvania: U.S. Geological Survey Open-File Report, Harrisburg, Pa., 1976. Data include records of wells and springs, chemical analyses, hydrographs, and a map showing well and spring locations.
2. (and Sloto, R. A.). Ground-water resources of Chester County, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 77–67, 76 p., illus. including geologic map, 1977. Water-bearing units, potential and reported yields, depth of wells and depth to water, specific-capacity data, water-budget analysis, basin yield, water quality, and groundwater use are discussed. In addition to the geologic map, there is a map showing locations of wells and springs, and a water-level-contour map.

McGREW, LAURA W., *see* de Witt, Wallace, Jr., 8, 10.

McGUIRE, MARY K.

1. Land suitability for on-lot disposal of domestic wastes, *in* Freedman, J. L., ed., "Lots" of danger—Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, p. 49–56, illus., 1977. Site examination methods, disposal methods, and maintenance of subsurface absorption area are discussed.

McGUIRE, W. H., *see* Weaver, O. D., 2, 3.

McHUGH, ROGER E., *see* Draper, John C., 1.

McINTOSH, WILLARD L.

1. (and Eister, M. F., compilers). Geologic map index of Pennsylvania, 1951–1971: U.S. Geological Survey, scale 1:750,000, 1973. The index shows areas covered by published geologic maps.

McINTOSH, WILLIAM C.

1. (and Hargraves, R. B.). Magnetic reversals in the Brunswick Formation of the Newark Group in New Jersey and eastern Penna. [abs.]: EOS (American Geophysical Union Transactions), v. 57, no. 4, p. 238, 1976.

McIVER, N. L.

1. Appalachian turbidites, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 69–81, illus.,

1970. Two Appalachian turbidite examples are summarized, the Martinsburg Formation (Upper Ordovician) and the "Portage" rocks (Upper Devonian).

McIVER, R. D., *see* Zielinski, R. E., 1.

McKAGUE, H. LAWRENCE

1. Statistical evaluation of petrographic data from the State Line serpentinite [abs.]: EOS (American Geophysical Union Transactions), v. 51, no. 4, p. 450, **1970.**

McKOWN, MARY M.

1. (and Tschrin, C. R., and Lee, P. P. F.). Investigation of matrix interferences for AAS trace metal analyses of sediments: U.S. Environmental Protection Agency Report EPA-600/7-78-085, 132 p., illus., **1978.** Includes analyses for 21 constituents in 17 samples of sediment from Toby Creek and the Clarion River, an area affected by acid mine drainage.

McLAUGHLIN, DEAN B., *see* MacLachlan, David B., 2.

McMILLAN, BARBARA A., *see* McNett, Charles W., Jr., 1.

McNAY, LEWIS M.

1. Surface mine reclamation, Moraine State Park, Pennsylvania: U.S. Bureau of Mines Information Circular 8456, 28 p., illus., **1970.** Description of methods employed and cost data are given for surface-mined land reclamation. A total of 177 acres was rehabilitated.

McNEAL, JAMES M.

1. (and Rose, A. W.). The geochemistry of mercury in sedimentary rocks and soils in Pennsylvania: Geochimica et Cosmochimica Acta, v. 38, no. 12, p. 1759–1784, illus., **1974.** Soils in Pennsylvania have much greater amounts of mercury than their parent rocks, suggesting that mercury may be added from an outside source. Environmental factors affected by the additional mercury are reviewed.
2. Abundance and occurrence of mercury and other trace metals in rocks, soils, and stream sediments in Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1975**; [abs.], Dissertation Abstracts International, v. 36, no. 4, p. 1616B–1617B, **1975.**

See also Smith, Robert C., II, 3.

McNETT, CHARLES W., JR.

1. (and McMillan, B. A., and Marshall, S. B.). The Shawnee-Minisink site, *in* Newman, W. S., and Salwen, Bert, eds., Amerinds and their paleoenvironments in northeastern North America: New York Academy of Sciences Annals, v. 288, p. 282–296, illus., **1977.** The site lies on a terrace above the floodplain of the Delaware River near Stroudsburg, Monroe County. The article concentrates on the actual excavation of the site and the description of artifacts recovered.

McPARTLIN, M. A., *see* Mitsch, William J., 1.

McSTRAW, MIKE

1. (and Wright, T. O.). Lithologic and faunal similarities between the Shochary Ridge sandstones and the Ramseyburg graywacke of eastern Pa. [abs.]: Pennsylvania Academy of Science Proceedings, v. 52, no. 1, p. 105, **1978.**

MEANS, JEFFREY L.

1. The structural geology of Penns Creek Valley, Pennsylvania and observations regarding specific sedimentological, geomorphological, and structural features: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

MECKEL, L. D., JR.

1. Paleozoic alluvial deposition in the central Appalachians: a summary, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 49–67, illus., **1970.** The general basin framework and stratigraphy of the alluvial sediments are described.

MEDLIN, J. H.

1. (and Coleman, S. L., Wood, G. H., Jr., and Rait, N.). Differences in minor and trace element geochemistry of anthracite in the Appalachian basin [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 7, p. 1198, **1975.**

See also Coleman, S. Lynn, 1.

MEIER, ALLEN L., *see* Tourtelot, Harry A., 1.

MEISER, EDGAR W., JR.

1. The geology and water resources of the Bellefonte-Mingoville area [Centre County], Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1971.**
2. Ground-water geology and a digital simulation of sustained yield potential of the Altoona area [Blair County], Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1975;** [abs.], Dissertation Abstracts International, v. 36, no. 11, p. 5477B–5478B, **1976.**

MEISLER, HAROLD

1. (and Becher, A. E.). Hydrogeology of the carbonate rocks of the Lancaster 15-minute quadrangle, southeastern Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 26, 149 p., illus. including geologic map, **1971.** The Cambrian and Ordovician limestone and dolomite that underlie lowlands of the Conestoga Valley in southeastern Pennsylvania were mapped and evaluated for groundwater potential.

See also Becher, Albert E., 2.

MEISSNER, C. R., *see* Coleman, S. Lynn, 1.

MENTZ, JOHN W.

1. (and Gorton, W. T., Yuill, C. B., and Ahnell, Gerald). Abandoned mined lands survey demonstration: Indiana and Cambria Counties, Pennsylvania, Appendix A—Identification of basins & watersheds, Appendix B—Surface mine tabulations, Appendix C—Refuse pile tabulations: U.S. Bureau of Mines Open-File Report 138(2)–78, 273 p., **1978** [not seen].
2. (and Gorton, W. T., Yuill, C. B., and Ahnell, Gerald). Abandoned mined lands survey demonstration: Indiana and Cambria Counties, Pennsylvania, Appendix D—Deep mine tabulations: U.S. Bureau of Mines Open-File Report 138(3)–78, 465 p., **1978** [not seen].
3. (and Gorton, W. T., Yuill, C. B., and Ahnell, Gerald). Abandoned mined lands survey demonstration: Indiana and Cambria Counties, Pennsylvania, Appendix E—Water quality tabulations: U.S. Bureau of Mines Open-File Report 138(4)–78, 373 p., **1978** [not seen].
4. (and Gorton, W. T., Yuill, C. B., and Ahnell, Gerald). Abandoned mined lands survey demonstration: Indiana and Cambria Counties, Pennsylvania—Boone County, West Virginia, Final report: U.S. Bureau of Mines Open-File Report 138(1)–78, 348 p., illus., **1978** [not seen].
5. (and Gorton, W. T., Yuill, C. B., and Ahnell, Gerald). Abandoned mined lands survey demonstration: mining information summary maps—Indiana and Cambria Counties, Pennsylvania: U.S. Bureau of Mines Open-File Report 138(7)–78, 44 p., **1978** [not seen].

6. (and Gorton, W. T., Yuill, C. B., and Ahnell, Gerald). Abandoned mined lands survey demonstration: property ownership maps—Indiana and Cambria Counties, Pennsylvania: U.S. Bureau of Mines Open-File Report 138(6)-78, 61 p., **1978** [not seen].

MENZIE, W. DAVID

1. Sedimentology of upper Chemung and Catskill sediments along the Appalachian Front in central Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1974.**

MERIN, I. S., *see* Podwysocki, M. H., 2.

MERKEL, EDWARD J.

1. Soil survey of Huntingdon County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 122 p., illus. including soils maps, **1978.** A formal description of the soil types found in the county is given and the soils are mapped in detail.

MERKEL, R. H.

1. The use of resistivity techniques to delineate acid mine drainage in ground water: Ground Water, v. 10, no. 5, p. 38-42, illus., **1972.** A resistivity survey run in an area of good geologic control demonstrated that the highly conductive acid water of contaminated aquifers is easily defined electrically.
2. (and Kaminski, J. T.). Mapping groundwater by using electrical resistivity with a buried current source: Ground Water, v. 10, no. 2, p. 18-25, illus., **1972** [not seen].

See also Chewning, John R., 1; Kaminski, Joseph T., 1; Lavin, Peter M., 1.

MERRILL, GLEN R.

1. The central Appalachians, *in* Sweet, W. C., and Bergström, S. M., eds., Symposium on conodont biostratigraphy: Geological Society of America Memoir 127, p. 407-414, illus., **1970-1971.** The central Appalachians contain conodont faunas ranging in age from at least Morrowan to late Virgilian, and the 12 zones delimited in this report appear to include a major part of the Pennsylvanian System.

MERRITT, GARY L.

1. (and Emrich, G. H.). The need for a hydrogeologic evaluation in a mine drainage abatement program: a case study: Toms Run, Clarion County, Pennsylvania: Symposium on Coal Mine Drainage Research, 3rd, Pittsburgh, Pa., 1970, Papers, p. 334-364, illus., **1970.** The hydrogeology of the Toms Run basin and how it relates to acid mine drainage pollution of surface water are described. Lithology and permeability of the underlying rock units are discussed. Included are lithologic descriptions and pumping-test results of three test wells.
2. The hydrogeology of the Toms Run drainage basin, Clarion County, Pennsylvania: Morgantown, West Virginia University, M.S. thesis, **1971.**
3. (and Angerman, T. W.). The use of ionic tracers in determining the subsurface flow of mine drainage, A case study: Symposium on Coal Mine Drainage Research, 4th, Pittsburgh, Pa., 1972, Papers, p. 340-343, **1972.** Ionic tracers were used to monitor the movement of groundwater. Tracers were placed in an active strip mine and in an abandoned deep mine in Clarion County. Continuous pumping tests in a nearby well confirmed the flow of groundwater from the two sites into the test well.

See also Emrich, Grover H., 1, 2.

MESOLELLA, KENNETH J.

1. (and Weaver, O. D.). What is the overall significance of Appalachia's Devonian pinnacle reefs?: Oil and Gas Journal, v. 73, no. 8, p. 98–100, 102–103, illus., **1975.** A significant Devonian reef discovery in McKean County represents the first major Onondaga pinnacle reef to be found outside of New York State and sets the stage for future exploration.
2. Paleogeography of some Silurian and Devonian reef trends, central Appalachian basin: American Association of Petroleum Geologists Bulletin, v. 62, no. 9, p. 1607–1644, illus., **1978.** The stratigraphic framework of Silurian-Devonian carbonate units in the Appalachian basin was established by supplementing outcrop information with several hundred borehole logs. The shifting of the axis of the basin is shown.

MESSINGER, DONALD J., *see* Walton, John C., 1.

METSGER, ROBERT W.

1. (and Willman, A. H., and Van Ness, C. G.). Field guide to the Friedensville mine [Lehigh County] of the New Jersey Zinc Company: Geological Society of America (Northeastern Section, Annual Meeting, Allentown, Pa., 1973) and New Jersey Zinc Company, Guidebook, 20 p., illus., **1973.** The history, mineral deposits, stratigraphy, structure, and mining and milling operations of the mine are discussed.
2. Mining problems in a karst valley—technical and social: Association of Engineering Geologists Bulletin, v. 16, no. 3, p. 427–447, illus., **1979.** The problems of mining in a karst terrain are epitomized by the Friedensville mine in Lehigh County. Historical background is provided and problems that have been encountered are discussed.

MEYER, R. F., *see* Sumner, John R., 4.

MEYERS, GEORGE

1. Interesting quarries in Pennsylvania: Rocks and Minerals, v. 49, no. 5, p. 296–297, illus., **1974.** Two quarries in eastern Pennsylvania, the Williams quarry (Northampton County) and the Bossardville quarry (Monroe County), are reviewed.

MEYERS, JAMES F., *see* Gray, Richard E., 3.

MEYERS, R. A.

1. (and Hamersma, J. W., Land, J. S., and Kraft, M. L.). Desulfurization of coal: Science, v. 177, no. 4055, p. 1187–1188, illus., **1972.** Coal combustion is the largest single source of sulfur oxide pollution. This report contains a summary of a method of treatment that removed 40 to 75 percent of the sulfur content of tested coals. Among those tested were the Pittsburgh and Lower Kittanning from western Pennsylvania.

MICHAEL, H. N., *see* Ralph, E. K., 1.

MICHALOPOULOS, A. P., *see* Palmer, E. C., 1.

MIHALCIN, B. M., *see* Thiers, G. R., 1.

MILAZZO, VALERIE A.

1. Land use and land cover, 1972, Lycoming County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-684, scale 1:50,000, 2 sheets, **1975.**

Activities directly related to the land and vegetation, water, natural surfaces, and artificial construction are depicted.

MILEWSKI, RAYMOND G.

1. A study of pollen deposition in Crystal Lake, Hartstown, Pennsylvania with special reference to the decomposition of pollen: University of Pittsburgh, Ph.D. thesis, **1978**; [abs.], Dissertation Abstracts International, v. 39, no. 8, p. 3670B, **1979.**

MILICI, ROBERT C.

1. (and Harris, L. D.). Structural subdivision of the Valley and Ridge and Appalachian Plateaus physiographic provinces [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 229–230, **1976.**

MILLBROOKE, ANNE

1. The Geological Society of Pennsylvania 1832–1836 [Part 1]: Pennsylvania Geology, v. 7, no. 6, p. 7–11, **1976.** The founding of the society is reviewed and prominent individuals supporting the society's purposes are introduced.
2. The Geological Society of Pennsylvania 1832–1836 [Part 2]: Pennsylvania Geology, v. 8, no. 2, p. 12–16, **1977.** The establishment of a state survey by an act of legislation is reviewed.

MILLER, A. C.

1. (and Chadderton, R. A., and Brown, S. A.). The Loyalsock Creek model study, *in* Verification of mathematical and physical models in hydraulic engineering: American Society of Civil Engineers, Hydraulic Division, Annual Special Conference, 26th, College Park, Md., 1978, Proceedings, p. 745–752, illus., **1978** [not seen].

MILLER, BETTY M.

1. A summary of oil and gas production and reserve histories of the Appalachian basin, 1859–1972: U.S. Geological Survey Bulletin 1409, 36 p., illus., **1975.** A compilation of the oil and gas production and reserve histories, based chiefly on published data.

MILLER, CHARLES E., JR.

1. A reconnaissance survey of bryozoan distribution within the Keyser Limestone (Silurian-Devonian) of central Pennsylvania: University Park, Pennsylvania State University, D.Ed. thesis, **1979.**

MILLER, JERE F.

1. (and Wehler, Ned E.). Geology of the Marticville-Smithville area, Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1972.**

MILLER, JOHN T.

1. (and Wells, R. B.). The geology of the Hidden Valley Boy Scout Camp area, Perry County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 30, 2nd ed., 45 p., illus. including geologic map, **1971.** A generalized review of the stratigraphy (Silurian) and structure of the area.

MILLER, KENNETH J.

1. Flotation of pyrite from coal: pilot plant study: U.S. Bureau of Mines Report of Investigations 7822, 15 p., illus., **1973.** Pilot plant tests show that pyrite flotation, using potassium amyl xanthate and a coal depressant, is a viable means of

removing pyritic sulfur from coals containing finely disseminated or unliberated pyrite that cannot be removed by coal flotation.

MILLER, M. F.

1. Paleoenvironmental analysis of the Tonoloway and lower Keyser Formation: Washington, D. C., George Washington University, M.S. thesis, **1971.**

MILLER, R. ADAM

1. (and Troxell, John, and Leopold, L. B.). Hydrology of two small river basins in Pennsylvania before urbanization [includes a section entitled "Observations of stream fauna" by Ruth Patrick and Robert R. Grant, Jr.]: U.S. Geological Survey Professional Paper 701-A, p. A1-A57, illus., **1971.** Data for water quantity, chemical quality, and suspended sediment were tabulated to record the conditions existing in the Pickering Creek basin and the East Branch Brandywine Creek basin (Chester County) to provide a basis for comparison in the future when land use in the basins changes from agricultural to metropolitan.
2. Hydrologic data of the June 1972 flood in Pennsylvania: Pennsylvania Department of Environmental Resources, Office of Resources Management, Water Resources Bulletin 9, 97 p., illus., **1974.** A compilation of data resulting from flooding caused by tropical storm Agnes on June 22 and 23, 1972.

MILLER, R. N.

1. A geochemical study of the inorganic constituents in some low-rank coals: University Park, Pennsylvania State University, Ph.D. thesis, **1977.**

MILLER, RALPH L.

1. Oil and gas data from the Upper and Middle Ordovician rocks in the Appalachian basin: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-917-C, scale 1:2,500,000, 3 sheets, **1975.** A synthesis of available subsurface information on Upper and Middle Ordovician rocks, including thickness and extent, generalized areas of oil or gas production, thickness of clastic rocks, thickness of carbonate rocks, and structure on top of the Ordovician.

MILLER, ROBERT B.

1. Woodcock Valley—its glacial history and relationship to the glacial and preglacial drainage of northwestern Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1973.**

MILLER, ROGER C.

1. Cumberland Valley agate: Pennsylvania Geology, v. 2, no. 4, p. 33-34, illus., **1971.** A 200-foot-wide zone bearing concretions was found in the Beekmantown Group from Mt. Rock, Cumberland County, to Scotland, Franklin County.

MILLER, THEODORE L., *see* Brush, Edward J., 1.

MILLER, THOMAS J., *see* Calamari, John J., 1.

MILLET, RICHARD A., *see* Lovegreen, Jon R., 1.

MINARD, JAMES P., *see* Owens, James P., 1, 2.

MINKIN, JEAN A.

1. (and Finkelman, R. B., Thompson, C. L., Cecil, C. B., Stanton, R. W., and Chao, E. C. T.). Arsenic-bearing pyrite in Upper Freeport coal, Indiana Coun-

ty, Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 140–141, **1979.**

See also Finkelman, Robert B., 7.

MITCHELL, GARETH D.

1. A petrographic classification of solid residues for the evaluation of coal performance during the hydrogenation of bituminous coal: University Park, Pennsylvania State University, M.S. thesis, **1978.**

MITSCH, WILLIAM J.

1. (and McPartlin, M. A., and Letterman, R. D.). Energetic evaluation of a stream ecosystem affected by coal mine drainage: International Association of Theoretical and Applied Limnology Proceedings, v. 20, pt. 2, p. 1388–1395, illus., **1978** [not seen].
2. (and Letterman, R. D.). Mine drainage impact on water quality and ecosystem energetics in a western Pennsylvania stream, *in* Samuel, D. E., and others, eds., Surface mining and fish/wildlife needs in the eastern United States—Addendum to proceedings of a symposium: U.S. Department of the Interior, Fish and Wildlife Service, Report FWS/OBS-78/81 A, p. 99–106, illus., **1979.** Using 15 sampling stations located along Bens Creek (Somerset County), the water quality and aquatic life above and below underground mine discharge points were evaluated. Sulfates and iron showed the most dramatic changes and were accompanied by a 96.2 percent reduction in ecosystem energetics.

MOCK, S. J.

1. Topological properties of some trellis channel networks: CRREL (Cold Regions Research and Engineering Laboratory) Report 76–46, 50 p., illus., **1976** [not seen].

MOEBS, NOEL N.

1. (and Curth, E. A.). Geologic and ground-control aspects of an experimental shortwall operation in the upper Ohio Valley: U.S. Bureau of Mines Report of Investigations 8112, 30 p., illus., **1976.** The shortwall method utilized in mining the Pittsburgh coal bed at the Pennsylvania-West Virginia state line in Washington County increased recovery by 5.4 percent because of roof caving and pressure relief.
2. Roof rock structures and related roof support problems in the Pittsburgh coalbed of southwestern Pennsylvania: U.S. Bureau of Mines Report of Investigations 8230, 30 p., illus., **1977**; reprinted *in* Root, S. I., compiler, Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey, 4th ser., Information Circular 84, p. 31–64, illus., **1979.** The mine roof was examined along a section of main entries in the Pittsburgh coal bed in southwestern Pennsylvania. Various sedimentary structures are described that contributed directly to irregular and unstable roofs.

MOIR, RANDALL W.

1. A pedological and palynological investigation of a "feature" from the site of Fort Pleham: Meadville, Pa., Allegheny College, Bachelor's thesis, **1973.**

MONAHAN, JOHN, *see* Dean, Bruce, 1.

MONTGOMERY, ARTHUR

1. Pennsylvania minerals [1]: Keystone Newsletter, v. 11, no. 11, p. 4, **1962.** The author announces the beginning of a project, in cooperation with the Mineralogical

Society of Pennsylvania, to update Samuel G. Gordon's *The Mineralogy of Pennsylvania* (1922). This is the first in a series of articles and serves as an introduction to the articles that follow.

2. Pennsylvania minerals (2): Keystone Newsletter, v. 11, no. 12, p. 4–5, **1962.** An outline of the articles to follow.
3. Pennsylvania minerals (3): Keystone Newsletter, v. 12, no. 1, p. 5–6, **1963.** Includes a preliminary listing of Pennsylvania minerals.
4. Pennsylvania minerals (4): Keystone Newsletter, v. 12, no. 2, p. 4, **1963.** Fifteen species, all uranium minerals, are listed.
5. Pennsylvania minerals (5): Keystone Newsletter, v. 12, no. 3, p. 5, **1963.** Linarite, devillite, and cordierite are added to the list of Pennsylvania minerals.
6. Pennsylvania minerals (6): Keystone Newsletter, v. 12, no. 4, p. 5, **1963.** Four new species are included in the list of Pennsylvania minerals: clausthalite, thorogummite, thorianite, and thorite.
7. Pennsylvania minerals (7): Keystone Newsletter, v. 12, no. 5, p. 5, **1963.** Dickite, montmorillonite, sauconite, and illite are four clay minerals added to the list of Pennsylvania species. Three more additions are the plagioclase feldspars andesine and bytownite, and clinozoisite, a mineral in the epidote group.
8. Pennsylvania minerals (8): Keystone Newsletter, v. 12, no. 6, p. 8, **1963.** Antigorite, chrysotile, and wurtzite are added to the list of Pennsylvania minerals.
9. Pennsylvania minerals (9): Keystone Newsletter, v. 12, no. 7, p. 4, **1963.** An up-to-date list of Pennsylvania minerals is presented.
10. Pennsylvania minerals (10): Keystone Newsletter, v. 12, no. 8, p. 5, **1963.** Summary of the first nine articles.
11. Pennsylvania minerals (12): Keystone Newsletter, v. 12, no. 10, p. 5, **1963.** Lanthanite, a very scarce rare-earth carbonate, was discovered at the Friedensville zinc mines, Lehigh County, in 1853. It is significant because it is the only discovery in Pennsylvania.
12. Pennsylvania minerals (13): Keystone Newsletter, v. 12, no. 11, p. 5, **1963.** Lansfordite and nesquehonite, unique among Pennsylvania minerals, were first discovered in Pennsylvania and carry the names of towns near the discovery sites.
13. Pennsylvania minerals (14): Keystone Newsletter, v. 12, no. 12, p. 6, **1963.** Prehnite crystals from Cornog, Chester County, are discussed.
14. Pennsylvania minerals (15): Keystone Newsletter, v. 13, no. 1, p. 4, **1964.** The geologic origin of prehnite is discussed, and localities are given.
15. Pennsylvania minerals (16): Keystone Newsletter, v. 13, no. 2, p. 4, **1964.** Clinozoisite from Cornog, Chester County, is described. The origin of the crystals is discussed.
16. Pennsylvania minerals (17): Keystone Newsletter, v. 13, no. 3, p. 6, **1964.** The occurrence of axinite at two localities in Pennsylvania is described.
17. Pennsylvania minerals (18): Keystone Newsletter, v. 13, no. 4, p. 6, **1964.** New localities for prehnite are described. Two new species, digenite and pyroaurite, are added to the list of Pennsylvania minerals.
18. Pennsylvania minerals (19): Keystone Newsletter, v. 13, no. 5, p. 4, **1964.** Datolite is discussed.
19. Pennsylvania minerals (20): Keystone Newsletter, v. 13, no. 6, p. 5, **1964.** Collecting localities for apophyllite are reviewed.
20. Pennsylvania minerals (21): Keystone Newsletter, v. 13, no. 7, p. 6, **1964.** The occurrences of apophyllite and associated minerals are discussed.
21. Pennsylvania minerals (22[a]): Keystone Newsletter, v. 13, no. 8, p. 5, **1964.** The geologic setting of zeolites, found mostly in Triassic diabase, is reviewed.

22. Pennsylvania minerals (22[b]): Keystone Newsletter, v. 13, no. 9, p. 4, **1964.** Epidesmine is of special interest to mineral collectors because most localities occur in Pennsylvania. Geologic descriptions of the localities are given.
23. Pennsylvania minerals (23): Keystone Newsletter, v. 13, no. 10, p. 6, **1964.** Dumortierite, a recent addition to the mineral list, is described. The location and identification process are discussed.
24. Pennsylvania minerals (25): Keystone Newsletter, v. 13, no. 12, p. 4, **1964–1965.** Molybdenite is reviewed in the literature, and the geologic setting is described.
25. Pennsylvania minerals (26): Keystone Newsletter, v. 14, no. 2, p. 4, **1965.** Localities for molybdenite are listed.
26. Pennsylvania minerals (27[a]): Keystone Newsletter, v. 14, no. 2, p. 6, **1965.** The geochemistry of molybdenum is reviewed.
27. Pennsylvania minerals (27[b]): Keystone Newsletter, v. 14, no. 3, p. 4–5, **1965.** The geologic source of beryl is discussed.
28. Pennsylvania minerals (28): Keystone Newsletter, v. 14, no. 4, p. 4–5, **1965.** Early descriptions of beryl are reviewed.
29. Pennsylvania minerals (29): Keystone Newsletter, v. 14, no. 5, p. 5–6, **1965.** Allanite, a common mineral in the crystalline rocks of eastern Pennsylvania, is described.
30. Pennsylvania minerals (30): Keystone Newsletter, v. 14, no. 6, p. 12, **1965.** The geochemistry of zircon is reviewed.
31. Pennsylvania minerals (31): Keystone Newsletter, v. 14, no. 7, p. 6–7, **1965.** The use of zircon for age determination is discussed.
32. Pennsylvania minerals (32): Keystone Newsletter, v. 14, no. 8, p. 5–6, **1965.** Zircon crystals from Chestnut Hill, near Easton, Northampton County, are described.
33. Pennsylvania minerals (33): Keystone Newsletter, v. 14, no. 9, p. 5–6, **1965.** Occurrences of wulfenite (lead molybdate) are described.
34. Pennsylvania minerals (34): Keystone Newsletter, v. 14, no. 10, p. 5–6, **1965.** Minerals rare to Pennsylvania are reviewed. They include descloizite, gersdorffite, and vauquelinite.
35. Pennsylvania minerals (35): Keystone Newsletter, v. 14, no. 11, p. 5–6, **1965.** Scheelite (calcium tungstate) is described.
36. Pennsylvania minerals (36): Keystone Newsletter, v. 14, no. 12–v. 15, no. 1, p. 5, **1965–1966.** Crandallite, a hydrous calcium aluminum phosphate, has been located in Juniata County and is reviewed. The mineral retgersite has been replaced by morenosite on the Pennsylvania list and coeruleolactite has been added.
37. Pennsylvania minerals (37): Keystone Newsletter, v. 14, no. 12–v. 15, no. 1, p. 7–8, **1965–1966.** A mineral identification project involving specimens from the Ecton mine (Montgomery County) is reported.
38. Pennsylvania minerals (38): Keystone Newsletter, v. 15, no. 2, p. 3, **1966.** The list of Pennsylvania minerals is updated.
39. Pennsylvania minerals (39): Keystone Newsletter, v. 15, no. 3, p. 6, **1966.** Ten new minerals have been added to the list of Pennsylvania minerals based on identification by optical and X-ray methods. They are artinite, hedenbergite, kammererite, leonhardtite, perovskite, pickeringite, pigeonite, pyrope, scapolite, and stevensite.
40. Pennsylvania minerals (40): Keystone Newsletter, v. 15, no. 4, p. 6–7, **1966.** Changes to, and deletions from, the Pennsylvania list are discussed.
41. Pennsylvania minerals (41): Keystone Newsletter, v. 15, no. 5, p. 6–7, **1966.** The occurrence of ancylite at Cornog, Chester County, is described.
42. Pennsylvania minerals (42): Keystone Newsletter, v. 15, no. 6, p. 6–7, **1966.** Two interesting minerals, axinite and sphene, have been located at Cornog, Chester County.

43. Pennsylvania minerals (43): Keystone Newsletter, v. 15, no. 7, p. 6–7, **1966.** The occurrence of axinite and associated minerals in the Keystone quarry at Cornog, Chester County, is described.
44. Pennsylvania minerals (44): Keystone Newsletter, v. 15, no. 8, p. 7–8, **1966.** The discussion of axinite in entry 43 is continued.
45. Pennsylvania minerals (45): Keystone Newsletter, v. 15, no. 9, p. 7, **1966.** Wollastonite, which occurs at only two known localities in Pennsylvania, is reviewed.
46. Pennsylvania minerals (46): Keystone Newsletter, v. 15, no. 10, p. 6, **1966.** Three previously identified minerals—halite, hyalophane, and harmotome—are reviewed.
47. Pennsylvania minerals (47): Keystone Newsletter, v. 15, no. 11, p. 7–8, **1966.** The story of one of Pennsylvania's most interesting minerals, ancylite, is continued from a previous article (see entry 41).
48. Pennsylvania minerals (48): Keystone Newsletter, v. 15, no. 12, p. 9, **1966.** The third in a series of articles on ancylite (see entries 41 and 47).
49. Pennsylvania minerals (49): Keystone Newsletter, v. 16, no. 1, p. 5, **1967.** A summary of progress to date in the compilation of an updated list of Pennsylvania minerals.
50. Pennsylvania minerals (50): Keystone Newsletter, v. 16, no. 2, p. 7, **1967.** Two common sulfides of lead and zinc, galena and sphalerite, are reviewed.
51. Pennsylvania minerals (51): Keystone Newsletter, v. 16, no. 3, p. 7–8, **1967.** Occurrences of galena are grouped by geologic locality and reviewed.
52. Pennsylvania minerals (52): Keystone Newsletter, v. 16, no. 4, p. 7–8, **1967.** Known localities for galena in Carbon and Columbia Counties are reviewed.
53. Pennsylvania minerals (53): Keystone Newsletter, v. 16, no. 5, p. 7, **1967.** Galena localities in Huntingdon and Blair Counties are reviewed.
54. Pennsylvania minerals (54): Keystone Newsletter, v. 16, no. 6, p. 10, **1967.** Lancaster County galena localities are noted.
55. Pennsylvania minerals (55): Keystone Newsletter, v. 16, no. 7, p. 6, **1967.** Galena deposits at the Pequea mine, Lancaster County, are discussed.
56. Pennsylvania minerals (56): Keystone Newsletter, v. 16, no. 8, p. 10, **1967.** The geology of the Bamford zinc mine in Lancaster County, a well-known galena locality, is described.
57. Pennsylvania minerals (57): Keystone Newsletter, v. 16, no. 9, p. 9, **1967.** Additional galena localities that are closely associated with Triassic diabase are discussed.
58. Pennsylvania minerals (58): Keystone Newsletter, v. 16, no. 10, p. 8, **1967.** Galena and sphalerite occurrences in Bucks County are described.
59. Pennsylvania minerals (59): Keystone Newsletter, v. 16, no. 11, p. 9, **1967.** The galena deposits near Phoenixville, in Chester and Montgomery Counties, are reviewed.
60. Pennsylvania minerals (60): Keystone Newsletter, v. 16, no. 12, p. 7–8, illus., **1967.** The geology of the Phoenixville mining district (Chester and Montgomery Counties) is discussed and a map is included.
61. Pennsylvania minerals (61): Keystone Newsletter, v. 17, no. 1, p. 8, **1968.** The geologic events that led to the lead-zinc-copper mineralization of the Phoenixville deposits (Chester and Montgomery Counties) are summarized.
62. Pennsylvania minerals (62): Keystone Newsletter, v. 17, no. 2, p. 10, **1968.** The assumptions concerning the Triassic age of the diabase dikes of the Phoenixville deposits (Chester and Montgomery Counties) are questioned.
63. Pennsylvania minerals (63): Keystone Newsletter, v. 17, no. 3, p. 9, **1968.** Galena occurrences, associated with copper-uranium minerals in sedimentary rocks of

Devonian age, are described. Localities are in Columbia, Lycoming, and Sullivan Counties.

64. Pennsylvania minerals (64): Keystone Newsletter, v. 17, no. 4, p. 8–10, **1968.** A description by Douglas C. Biggs of minerals collected from a vug in the Keystone quarry at Cornog, Chester County.
65. Pennsylvania minerals (65): Keystone Newsletter, v. 17, no. 5, p. 10, **1968.** A galena locality in Schuylkill County is reported. Older occurrences of galena, in Northampton and Chester Counties, are also reviewed.
66. Pennsylvania minerals (66): Keystone Newsletter, v. 17, no. 7, p. 7, **1968.** Galena is further discussed, and occurrences are cited.
67. Pennsylvania minerals (67): Keystone Newsletter, v. 17, no. 7, p. 8, **1968.** The sphalerite occurrence at Friedensville (Lehigh County) is described.
68. Pennsylvania minerals (68): Keystone Newsletter, v. 17, no. 8, p. 8, **1968.** A geochemical investigation involving the lead and zinc minerals of Pennsylvania is reviewed.
69. Pennsylvania minerals (69): Keystone Newsletter, v. 17, no. 9, p. 10, **1968.** The concluding article on the galena-sphalerite occurrences in Pennsylvania contains a summary of the major findings of the series.
70. Pennsylvania minerals (70): Keystone Newsletter, v. 17, no. 10, p. 8–9, **1968.** Two new mineral occurrences are reported. Turquoise, occurring at the Bachman mine in Hellertown (Northampton County), is described. At the Kibblehouse quarry at Perkiomenville (Montgomery County), there is an occurrence of axinite.
71. Pennsylvania minerals (71): Keystone Newsletter, v. 17, no. ll, p. 8, **1968.** The Keystone quarry at Cornog, Chester County, contains many species of minerals. A list is included.
72. Pennsylvania minerals (72): Keystone Newsletter, v. 17, no. 12, p. 10, **1968.** The mineralization at the Keystone quarry at Cornog, Chester County, is explained.
73. Pennsylvania minerals (73): Keystone Newsletter, v. 18, no. 1, p. 10, **1969.** The occurrence of the rare-earth carbonate ancylite in the Keystone quarry at Cornog (Chester County) is reviewed, and the geology is described.
74. Pennsylvania minerals (74): Keystone Newsletter, v. 18, no. 2, p. 10, **1969.** The mineralogy of the very scarce ancylite crystals found in the Keystone quarry at Cornog (Chester County) is reviewed.
75. Pennsylvania minerals (75): Keystone Newsletter, v. 18, no. 3, p. 8–9, **1969.** The geologic history and origin of the ancylite at Cornog (Chester County) was studied. The investigation is discussed.
76. Pennsylvania minerals (76): Keystone Newsletter, v. 18, no. 4, p. 9, **1969.** The geochemistry of the ancylite from the Keystone quarry at Cornog (Chester County) is discussed.
77. Pennsylvania minerals (77): Keystone Newsletter, v. 18, no. 5, p. 9–10, **1969.** A review of the project to update Samuel G. Gordon's *The mineralogy of Pennsylvania* (1922), including a brief discussion of minerals added or deleted.
78. Pennsylvania minerals (78): Keystone Newsletter, v. 18, no. 6, p. 9, **1969.** A discussion of the contents and format of the new book on the mineralogy of Pennsylvania.
79. Pennsylvania minerals (79): Keystone Newsletter, v. 18, no. 7, p. 9, **1969.** Belts where minerals occur that contain the rare elements uranium, thorium, zirconium, beryllium, and molybdenum are discussed generally.
80. Pennsylvania minerals (80): Keystone Newsletter, v. 18, no. 8, p. 10, **1969.** Reported occurrences in Pennsylvania of the rare-element minerals xenotime and euxenite are discussed.

81. Pennsylvania minerals (81): Keystone Newsletter, v. 18, no. 9, p. 9, **1969.** Four rare-element minerals reported in Pennsylvania—fergusonite, samarskite, columbite, and microlite—are reviewed.
82. Pennsylvania minerals (82): Keystone Newsletter, v. 18, no. 10, p. 9, **1969.** Columbite, an oxide of niobium and tantalum containing substantial amounts of iron and manganese, is discussed. Collecting localities are listed.
83. Pennsylvania minerals (83): Keystone Newsletter, v. 18, no. 11, p. 9–10, **1969.** Microlite and gadolinite are rare-element minerals reported in Pennsylvania. The occurrences, which are questionable, are reviewed.
84. Pennsylvania minerals (84): Keystone Newsletter, v. 18, no. 12, p. 10, **1969.** Rare-element minerals rich in uranium and thorium are discussed.
85. Pennsylvania minerals (85): Keystone Newsletter, v. 19, no. 1, p. 9–10, **1970.** Primary (uraninite) and secondary uranium minerals are reviewed. Localities are given.
86. Pennsylvania minerals (86): Keystone Newsletter, v. 19, no. 2, p. 8, **1970.** A secondary uranium mineral, meta-autinite, is reviewed and localities are cited.
87. Pennsylvania minerals (87): Keystone Newsletter, v. 19, no. 3, p. 10, **1970.** Torbernite, a secondary uranium mineral, is reviewed and localities are cited.
88. Pennsylvania minerals (88): Keystone Newsletter, v. 19, no. 4, p. 10, **1970.** The species "randite," named for a secondary uranium mineral discovered in the Philadelphia area, is actually a mixture of beta-uranophane and other minerals.
89. Pennsylvania minerals (89): Keystone Newsletter, v. 19, no. 5, p. 9–10, **1970.** An old specimen, possibly from Leiper's quarry in Avondale (Delaware County), contains at least four secondary uranium minerals, two of which—phosphuranylite and vandendriesscheite—are new to Pennsylvania. The paragenetic history is discussed.
90. Pennsylvania minerals (90): Keystone Newsletter, v. 19, no. 6, p. 10, **1970.** A specimen of a rare secondary uranium mineral, boltwoodite, is discussed. The locality is in Chester County.
91. Pennsylvania minerals (91): Keystone Newsletter, v. 19, no. 7, p. 10, **1970.** A specimen of coarse-grained pegmatite from the Glendale quarry, Delaware County, contains the secondary uranium minerals meta-autinite, metatorbernite, and a so-far-unidentified mineral closely related to phosphuranylite.
92. Pennsylvania minerals (92): Keystone Newsletter, v. 19, no. 8, p. 8, **1970.** Secondary uranium minerals from the Glendale quarry (Delaware County) are further discussed (see entry 91).
93. Pennsylvania minerals (93): Keystone Newsletter, v. 19, no. 9, p. 9, **1970.** Uranophane and associated uranium minerals are reported from the Glendale quarry (Delaware County).
94. Pennsylvania minerals (94): Keystone Newsletter, v. 19, no. 10, p. 10, **1970.** A reported occurrence of glauconite in Juniata County is discussed.
95. Pennsylvania minerals (95): Keystone Newsletter, v. 19, no. 11, p. 9–10, **1970.** Babingtonite has been discovered in Dyer's quarry near Reading, Berks County. Other minerals found in the quarry are also listed.
96. Pennsylvania minerals (96): Keystone Newsletter, v. 19, no. 12, p. 9, **1970.** Tscheffkinite (chevkinite), a mineral new to Pennsylvania, is described in an article by Robert C. Smith, II.
97. Swarthmore-Leidy collection [Pt. 1]: Mineralogical Record, v. 1, no. 2, p. 36, 38, 44, **1970.** The remnants of the Joseph Leidy collection of minerals, unearthed at Swarthmore College, were sent to Lafayette College. Nothing of great value appeared, but many beautifully crystallized minerals, some rare species, and others

representative of early classic localities enlarged and strengthened the collection at Lafayette College.

98. Swarthmore-Leidy collection, Pt. 2: Mineralogical Record, v. 1, no. 3, p. 84, 86, 91, 126, **1970.** This collection represents about 200 of the commonest minerals found in Pennsylvania. Some of the best specimens are listed and the localities given.
99. Pennsylvania minerals (100): Keystone Newsletter, v. 20, no. 4, p. 11–12, **1971.** A specimen of uraninite from the Vaux collection at Bryn Mawr College is discussed. The specimen is reported to be from Leiper's quarry at Avondale, Delaware County.
100. Pennsylvania minerals (104): Keystone Newsletter, v. 20, no. 8, p. 9–10, **1971.** Uranium minerals, collected at "Morrow's" (Leiper's) quarry, Avondale, Delaware County, are discussed. Included is one of the finest crystals of apparently unaltered uraninite found in Pennsylvania.
101. Pennsylvania minerals (105): Keystone Newsletter, v. 20, no. 9, p. 9, **1971.** Uranium minerals from "Morrow's" (Leiper's) quarry are further discussed (see entry 100). X-ray diffraction confirmed the presence of the secondary uranium mineral vandendriesscheite.
102. Pennsylvania minerals (106): Keystone Newsletter, v. 20, no. 10, p. 9–10, **1971.** Uranium minerals from Leiper's quarry at Avondale (Delaware County) and Comly's quarry at Germantown (Philadelphia County) are discussed.
103. Pennsylvania minerals (107): Keystone Newsletter, v. 20, no. 11, p. 8–9, **1971.** The genesis of secondary uranium minerals from southeastern Pennsylvania is discussed.
104. Pennsylvania minerals (108): Keystone Newsletter, v. 20, no. 12, p. 10, **1971.** Minerals from the Fritz Island iron mines near Reading, Berks County, are described.
105. Pennsylvania minerals (109): Keystone Newsletter, v. 21, no. 1, p. 9–10, **1972.** Gismondine, found at the Fritz Island iron mines (Berks County), is described.
106. Pennsylvania minerals (110): Keystone Newsletter, v. 21, no. 2, p. 7–9, illus., **1972.** The discussion of gismondine is continued (see entry 105). A mineral believed to be phillipsite was found on the faces of two gismondine specimens.
107. Pennsylvania minerals (111): Keystone Newsletter, v. 21, no. 3, p. 9–10, **1972.** Mineral specimens from the Fritz Island iron mines (Berks County) are discussed. They include phillipsite, chabazite, thomsonite, gismondine, and others.
108. Pennsylvania minerals (112): Keystone Newsletter, v. 21, no. 4, p. 7–8, illus., **1972.** Phillipsite, new to the list of Pennsylvania minerals, was identified in specimens from the Fritz Island iron mines, Berks County.
109. Pennsylvania minerals (113): Keystone Newsletter, v. 21, no. 5, p. 9–10, **1972.** A specimen from Vanartsdalen's quarry, Bucks County, consisting chiefly of microcline and scapolite, is described. A small jet-black crystal partly projecting from the microcline proved to be allanite, possibly the best-formed crystal of this mineral ever found in Pennsylvania.
110. Pennsylvania minerals (114): Keystone Newsletter, v. 21, no. 6, p. 7–8, illus., **1972.** A new mineral, cobaltite, has been located at the Kibblehouse quarry at Perkiomenville, Montgomery County.
111. Pennsylvania minerals (116): Keystone Newsletter, v. 21, no. 8, p. 10, **1972.** Fifteen validated mineral species new to Pennsylvania are listed.
112. Pennsylvania minerals (117): Keystone Newsletter, v. 21, no. 9, p. 9, **1972.** Seven additional minerals new to Pennsylvania were determined by X-ray diffraction: bararite, cryptohalite, huntite, mascagnite, realgar, rosasite, selenium, and tscher-

migite. Localities are given for each. Other changes to the list of Pennsylvania minerals are noted.

113. Pennsylvania minerals (120): Keystone Newsletter, v. 21, no. 12, p. 7–8, **1972.** A description of rozenite, a mineral new to Pennsylvania, which had altered from a pale-green waxy substance collected from coal waste piles of the Jeddo Highland Coal Company near Hazleton, Luzerne County.
114. An American mineralogist, Part I: Mineralogical Record, v. 4, no. 6, p. 256–261, illus., **1973;** Part II: Mineralogical Record, v. 5, no. 1, p. 34–39, illus., **1974;** Part III: Mineralogical Record, v. 5, no. 2, p. 59–66, illus., **1974;** Part IV: Mineralogical Record, v. 5, no. 3, p. 115–127, illus., **1974;** Part V: Mineralogical Record, v. 5, no. 4, p. 160–166, illus., **1974;** Part VI: Mineralogical Record, v. 5, no. 5, p. 211–214, illus., **1974;** Part VII: Mineralogical Record, v. 5, no. 6, p. 257–264, illus., **1974;** Part VIII: Mineralogical Record, v. 6, no. 1, p. 7–12, **1975;** Part IX: Mineralogical Record, v. 6, no. 2, p. 57–61, illus., **1975.** A series about Samuel G. Gordon (1897–1952), partly biographical and partly selections from his scientific and popular-interest writings. His major work is *The Mineralogy of Pennsylvania* (1922).
115. Pennsylvania minerals (121): Keystone Newsletter, v. 22, no. 1, p. 7, **1973.** Specimens from the Jeddo Highland Coal Company strippings near Hazleton, Luzerne County, were examined for rozenite, but none was discovered, suggesting that the original material is very scarce at this locality.
116. Pennsylvania minerals (125): Keystone Newsletter, v. 22, no. 5, p. 9–10, **1973.** A report by Robert C. Smith, II, on coffinite from Jim Thorpe, Carbon County.
117. Pennsylvania minerals (126): Keystone Newsletter, v. 22, no. 6, p. 8–9, **1973.** Specimens from the Kibblehouse quarry at Perkiomenville, Montgomery County, one of the most rewarding collecting localities in Pennsylvania, are reviewed.
118. Pennsylvania minerals (127): Keystone Newsletter, v. 22, no. 7, p. 9, **1973.** The review of minerals from the Kibblehouse quarry is continued (see entry 117).
119. Pennsylvania minerals (128): Keystone Newsletter, v. 22, no. 8, p. 8–9, illus., **1973.** The minerals from the Kibblehouse quarry are again reviewed (see entries 117 and 118). A sketch map is included.
120. Pennsylvania minerals (129): Keystone Newsletter, v. 22, no. 9, p. 5–6, **1973.** Anatase was identified at Kline's quarry near Wrightsville, York County.
121. Pennsylvania minerals (130): Keystone Newsletter, v. 22, no. 10, p. 6–7, illus., **1973.** The mineralogy of anatase, brookite, and other minerals, found at Kline's quarry in York County, is discussed.
122. Pennsylvania minerals (131): Keystone Newsletter, v. 22, no. 11, p. 4–5, illus., **1973.** An anatase locality at the Kunkletown sand quarries in Monroe County is reported.
123. Pennsylvania minerals (132): Keystone Newsletter, v. 22, no. 12, p. 4–5, illus., **1973.** Minerals from the Kibblehouse quarry, Montgomery County, are reviewed. A sketch map is included.
124. Pennsylvania minerals (133): Keystone Newsletter, v. 23, no. 1, p. 4, **1974.** Minerals from the Kibblehouse quarry (Montgomery County) include hornblende, arsenopyrite, and glaucodot.
125. Pennsylvania minerals (142): Keystone Newsletter, v. 23, no. 10, p. 4–5, illus., **1974.** Scolecite has been deleted from the list of Pennsylvania minerals and mesolite has been added. Glaucodot and arsenopyrite are described.
126. Pennsylvania minerals (143): Keystone Newsletter, v. 23, no. 11, p. 7–8, **1974.** Problems in identification of zaratite and genthite are discussed.
127. Pennsylvania minerals (144): Keystone Newsletter, v. 23, no. 12, p. 3, **1974.** Concluding article in the series.

128. Davis M. Lapham (1931–1974): Pennsylvania Geology, v. 6, no. 1, p. 2–3, **1975.**
129. Pennsylvania minerals (postscript): Keystone Newsletter, v. 24, no. 5, p. 8–9, **1975.** Corrections to the identities and occurrences of certain uranium minerals are made.
130. Pennsylvania minerals (second postscript): Keystone Newsletter, v. 24, no. 7, p. 7, **1975.** Corrections resulting from the restudy of the uranium minerals from the Williams quarry, Northampton County, are reported.

See also Grant, Raymond, 1; Keidel, F. A., 1.

MONTGOMERY, HUGH B.

1. Environmental analysis in local development planning, *in* Ferguson, H. F., ed., Geologic mapping for environmental purposes: Geological Society of America Engineering Geology Case Histories 10, p. 29–40, illus., **1974.** Examples of environmental problems from Pennsylvania are cited.

MOON, T. C.

1. (and Lucostic, C. M.). Effects of acid mine drainage on a southwestern Pennsylvania stream: Water, Air, and Soil Pollution, v. 11, no. 3, p. 377–389, illus., **1979** [not seen].

MOORE, T. D., JR.

1. (and Deul, Maurice, and Kissell, F. N.). Longwall gob degasification with surface ventilation boreholes above the Lower Kittanning coalbed: U.S. Bureau of Mines Report of Investigations 8195, 13 p., illus., **1976** [not seen].

MOORSHEAD, FRANK A.

1. An investigation of stream infiltration in the carbonate Nittany Valley of south-central Pennsylvania: University Park, Pennsylvania State University, Master's paper, **1975.**

MORAN, STEPHEN R., *see* Gross, David L., 1.

MOREN, A., *see* Sumner, John R., 1.

MORGAN, BENJAMIN A.

1. Metamorphic map of the Appalachians: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-724, 10 p., 1 pl., scale 1:2,500,000, **1972.** The major metamorphic belts of the Appalachian Mountain system are depicted. Degrees of metamorphism are expressed in terms of isograds, mineral facies, and mineral-facies series.
2. The Baltimore Complex, Maryland, Pennsylvania, and Virginia, *in* Coleman, R. G., and Irwin, W. P., eds., North American ophiolites: Oregon Department of Geology and Mineral Industries Bulletin 95, p. 41–49, illus. including geologic map, **1977.** The mafic and ultramafic rocks of the Baltimore Complex are one of the largest associations of such rocks in the Appalachians. The rocks are part of an ophiolite sequence that was disrupted during emplacement and subsequently severely deformed and metamorphosed.

MORISAWA, M.

1. (and LaFlure, J. E.). Hydraulic geometry, stream equilibrium, and urbanization, *in* Rhodes, D. D., and others, eds., Adjustments of the fluvial system: Annual Geomorphology Symposium, 10th, p. 333–350, illus., **1979** [not seen].

MORNING, JOHN L., *see* Paone, James, 1.

MORREALE, JOANNE or JOANN, *see* Karcz, Iaakov, 1, 2.

MORRIS, ROBERT W.

1. (and Rollins, H. B., and Shaak, G. D.). A new ophiuroid from the Brush Creek shale (Conemaugh Group, Pennsylvanian) of western Pennsylvania: Journal of Paleontology, v. 47, no. 3, p. 473–478, illus., **1973.** *Syntomospina kuehni,* n. gen. and sp., is the first articulated ophiuroid species to be described from the Upper Carboniferous. *S. kuehni* is readily distinguishable on the basis of its restricted spinosity and reduced oral arm plates. Associated fauna and stratigraphic evidence suggest that these ophiuroids were buried in marginal-marine tidal-flat sediments during the regressive phase of the Brush Creek marine event.

See also Harper, John A., 1.

MORTENSEN, MARTIN E., *see* Smith, Donald M., 1.

MOSER, LYNN

1. (and Piotrowski, R. G.). Continued success in gas exploration: Pennsylvania Geology, v. 10, no. 2, p. 8–12, illus., **1979.** Summary of a 1977–78 exploration program for natural gas in Pennsylvania.

MOSHIER, STEPHEN O.

1. Depositional regimes in the Upper Cambrian Richland Formation, Lebanon Valley, Pennsylvania: Binghamton, State University of New York, M.A. thesis, **1979.**

MOSS, JOHN H.

1. (and Kochel, Craig). Unusual aspects of the Hurricane Agnes flood, Conestoga River drainage basin, southeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 199, **1973.**
2. Periglacial origin of extensive lobate colluvial deposits on the south flank of Blue Mountain near Shartlesville and Strausstown, Berks County, Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 50, no. 1, p. 42–44, illus., **1976.** The quartzitic deposits are described and their origin suggested.
3. (and Kochel, R. C.). Unexpected geomorphic effects of the Hurricane Agnes storm and flood, Conestoga drainage basin, southeastern Pennsylvania: Journal of Geology, v. 86, no. 1, p. 1–11, illus., **1978.** Rainfall intensity over a short time, rather than total rainfall of the storm, was the most important precipitation factor in determining the runoff caused by the storm. Saturated ground and unwise construction contributed to the flood's magnitude.

MOTOOKA, J. M., *see* Lesure, F. G., 1.

MOTTO, HARRY L., *see* Novak, Robert J., 1.

MOWREY, G. L., *see* Hardy, H. Reginald, Jr., 2.

MOYER, CAROL

1. Stratigraphy of the upper Monongahela-lower Dunkard Groups in Marion and Monongalia Counties, West Virginia, *in* Donaldson, A. C., and others, eds., Field trip guidebook for Carboniferous coal short course: West Virginia Geological and Economic Survey Bulletin B-37-2, p. 158–174, illus., **1979.** Stratigraphic information on the Waynesburg coal and the rocks approximately 50 feet above and below is presented. The study area includes parts of the Oak Forest, Garards Fort, Osage, and Blacksville 7½-minute quadrangles.

MROSE, MARY E., *see* Finkelman, Robert B., 3.

MUESSIG, K. W., *see* Foland, K. A., 2.

MULLER, OTTO H.

1. The Scranton gravity high: Rochester, N. Y., University of Rochester, M.S. thesis, **1972.**
2. (and Ackermann, H. D., Diment, W. H., Lavin, P. M., LeClair, L. D., Revetta, F. A., Sumner, J. R., Trembley, J. A., and Urban, T. C.). A preliminary gravity map of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 46, **1979.**

MUNDI, EMMANUEL K.

1. Elastic and viscoelastic behavior of two sedimentary rocks: University Park, Pennsylvania State University, M.S. thesis, **1970.**
2. The physical characteristics of some fractured aquifers in central Pennsylvania and a digital simulation of their sustained yields: University Park, Pennsylvania State University, Ph.D. thesis, **1972;** [abs.], Dissertation Abstracts International, v. 33, no. 12, pt. 1, p. 5918B, **1973.**
3. (and Parizek, R. R.). Three methods of determining the hydraulic parameters of fractured aquifers: Cameroun, Universite Federale, Faculte des Sciences, Annales, no. 19, p. 29–48, illus., **1975** [not seen].

MURPHY, JAMES L.

1. Coiled nautiloid cephalopods from the Brush Creek limestone (Conemaugh) of eastern Ohio and western Pennsylvania: Journal of Paleontology, v. 44, no. 2, p. 195–205, illus., **1970.** Six species, two new, of nautiloid cephalopods from the Brush Creek limestone in the lower Conemaugh Group in Ohio and Pennsylvania are described and illustrated.
2. *Protosalvinia (Foerstia)* zone in the Upper Devonian sequence of eastern Ohio, northwestern Pennsylvania, and western New York: Geological Society of America Bulletin, v. 84, no. 10, p. 3405–3410, illus., **1973.** The discovery of an Upper Devonian index-fossil alga zone that can be traced from Ashtabula County, Ohio, through Erie County, Pennsylvania, and into Chautauqua County, New York, is significant because it allows refinement of the Upper Devonian stratigraphic section in this region.
3. Stratigraphic significance of a *Dunkleosteus* plate from the upper Riceville Shale: Ohio Journal of Science, v. 79, no. 5, p. 233–235, illus., **1979.** Discovery of a *Dunkleosteus* fish plate in dark shale and siltstone beneath the Cussewago Sandstone near Meadville, Crawford County, may help to clarify the Devonian-Mississippian strata in western Pennsylvania and eastern Ohio. A measured section is included.

MURPHY, JOANNE S.

1. An interpretation of a Baltimore Gneiss-Chickies Quartzite contact in the Philadelphia area: Philadelphia, Temple University, M.S. thesis, **1973.**

MURRIE, GARY W., *see* Diamond, W. Patrick, 3.

MUTTI, LARRY

1. The geology of uranium: Pennsylvania Naturalist, v. 2, no. 1, p. 20–21, 50, **1979.** A generalized, nontechnical review of uranium deposits in Pennsylvania.

MYER, GEORGE H.

1. (and De Santis, John, Grandstaff, B. E., and Grandstaff, D. E.). A multistage model of preservation in some fossil plants [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 304, **1977.**

See also Andrews, Richard O., 1; De Santis, John E., 2; Johnson, Richard C., 1.

MYERS, PAUL B., *see* Evenson, Edward B., 1.

NAMIE, RUSSELL

1. An analysis of Pleistocene drainage features of the Monongahela and Youghiogheny Rivers of southwestern Pennsylvania: California, Pa., California State College, M.S. thesis, **1973.**

NAUMAN, DOUGLAS

1. Surficial deposits in the lower White Deer Creek valley and on adjacent anticlinal slopes: Lewisburg, Pa., Bucknell University, Senior thesis, **1973.**

NEIL, JAMES K.

1. Metamorphic petrology of the Wissahickon and Peter's Creek Schists, Chester County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

THE NEILAN ENGINEERS, INC.

1. Kettle Creek mine drainage abatement survey: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 115, 88 p., variously paginated appendices, illus. [no date]. This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. Interim report for Little Conemaugh River watershed: Pennsylvania Department of Environmental Resources, Operation Scarlift Project 164-1, 14 p., illus., **1974.** See annotation in entry 1 above.

NEJIB, U. R.

1. (and Anderson, J.). Magnetic characteristics of multicolored shales from northeastern Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 46, p. 123–126, illus., **1972.** The authors correlated the magnetic susceptibility of iron, manganese, and nickel in shales collected from the Catskill Formation in a roadcut south of Wilkes-Barre. Through the measurement of the susceptibility in gradation zones between adjacent layers, it was possible to estimate the percentage contribution of these layers to the formation of the zone.

See also El-Ashry, M. T., 3.

NEWNHAM, R. E.

1. Gem stones: Earth and Mineral Sciences, v. 40, no. 1, p. 1–5, illus., **1970.** Composition, color, clarity, and technical production aspects of gemstones are reviewed.

NEWPORT, THOMAS G.

1. Ground-water resources of Montgomery County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 29, 83 p., illus., **1971.** The Brunswick and Stockton Formations (Triassic) occur over a large part of the county and yield sufficient water for industrial and municipal supplies. Chemical analyses of groundwater are included.
2. Summary ground-water resources of Clarion County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 32, 42 p., illus. including geologic map, **1973.** Data from wells drilled in the county indicate that the highest groundwater yields are obtained from aquifers in the Pocono Group and in the alluvium deposits. Excessive iron is the main water-quality problem.
3. Summary ground-water resources of Washington County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 38, 32 p., illus. including geologic map, **1973.** The Conemaugh Group is a source of small to moderate yields of water; the median yield is 5 gallons per minute. The alluvium is generally permeable and, where saturated, yields moderate to large supplies of water. The most undesirable constituent of the groundwater is iron.
4. Summary ground-water resources of Westmoreland County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 37, 49 p., illus. including geologic map, **1973.** The geologic units range from the Mississippian Pocono Group to Quaternary alluvium. The yields of wells drilled in alluvium range from 15 to 700 gallons per minute and average 230 gallons per minute. The Pottsville Group yields 20 to 500 gallons per minute, depending on whether the wells penetrate the full thickness of the sandstone. Chemical analyses show that, in many areas, the water is high in iron.
5. Summary ground-water resources of Luzerne County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 40, 63 p., illus. including geologic map, **1977.** The geologic units include the unconsolidated Quaternary deposits, the Pennsylvanian Llewellyn and Pottsville Formations, the Mississippian Mauch Chunk and Pocono Formations, and the Devonian Catskill Formation, marine beds, and Hamilton Group. The alluvial deposits have reported yields of over 1,000 gallons per minute in some areas. The Llewellyn Formation, marine beds, and Hamilton Group are the poorest bedrock aquifers; well yields from the other bedrock units range from 2 to 325 gallons per minute, and most wells produce soft water of good quality.

NEWSON, M. D.

1. Comment on "Seasonal fluctuations in the chemistry of limestone springs" by Evan T. Shuster and William B. White: Journal of Hydrology, v. 16, no. 1, p. 49–51, illus., **1972** [not seen].

NEWTON, CATHRYN R.

1. Aerobic, disaerobic and anaerobic facies within the Needmore Shale (Lower to Middle Devonian), *in* Dennison, J. M., and others, Devonian shales in south-central Pennsylvania and Maryland: Annual Field Conference of Pennsylvania Geologists, 44th, Bedford, Pa., Guidebook, p. 56–60, illus., **1979.** The macrofaunas of the Needmore Shale occur in three distinctive assemblages which correspond to layers of oxygenation within a stagnant Lower to Middle Devonian Appalachian basin.

NICHOLS, PAUL H., *see* Scharnberger, Charles K., 3.

NICHOLSON, S. W.

1. Correlation of geophysical and petrographic studies across the Rosemont fault, southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1977.**

NICKELSEN, RICHARD P.

1. Attributes of rock cleavage in some mudstones and limestones of the Valley and Ridge province, Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 46, p. 107–112, illus., **1972.** The rock cleavages are stylolite-like, tectonically oriented partings of insoluble residue abutting partially dissolved fossils and solution-elongated grains. Recent descriptions suggest that most cleavage attributes can be attained before metamorphism.
2. Origin of cleavage and distorted mudcrack polygons [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 59, **1974.**
3. Early jointing and cumulative fracture patterns, *in* Hodgson, R. A., and others, eds., Proceedings of the First International Conference on the New Basement Tectonics [Salt Lake City, Utah, 1974]: Utah Geological Association Publication 5, p. 193–199, illus., **1976.** A summary of some descriptive and historical attributes of fracture patterns that have been established through field studies; several examples are from Pennsylvania.
4. Sequence of structural phases, Allegheny orogeny, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 235, **1976.**
5. Sequence of structural stages of the Alleghany orogeny, at the Bear Valley strip mine, Shamokin, Pennsylvania: American Journal of Science, v. 279, no. 3, p. 225–271, illus., **1979.** All recognized structural stages of the Alleghany orogeny in the northern Valley and Ridge province are visible in this large strip mine. Because all structural stages are superimposed at one place, progressive deformation and the relative time of formation of joints, rock cleavage, minor folds, faults, and major folds can be proven.

See also Faill, Rodger T., 8.

NOLTIMIER, HALLAN C., *see* Smith, Timothy E., 1.

NORTON, C. WARREN

1. Biogenic mounds in the lower Conemaugh (Missourian, Pennsylvanian) of the Appalachian basin, *in* Donahue, J., and Rollins, H. B., Conemaugh (Glenshaw) marine events: American Association of Petroleum Geologists, Eastern Section, Annual Meeting, 3rd, and Society of Economic Paleontologists and Mineralogists, Eastern Section, Spring Field Trip, Pittsburgh, Pa., 1974, p. B1–B6, illus., **1974.** Prominent carbonate mounds found in limestone units of the Brush Creek and Pine Creek marine intervals of the Glenshaw Formation near New Kensington (Westmoreland County) are described and a hypothesis is presented regarding their formation.
2. Foraminiferal distribution and paleogeography of the Brush Creek marine event (Missourian:Pennsylvanian) in the Appalachian basin: University of Pittsburgh, Ph.D. thesis, **1975;** [abs.], Dissertation Abstracts International, v. 36, no. 10, p. 4913B, **1976.**
3. Paleoecology and distribution of Foraminiferida in the Brush Creek marine event (Missourian:Pennsylvanian), Appalachian basin [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 101–102, **1975.**
4. Foraminiferal distributions and paleogeography of the Brush Creek marine event (Missourian:Pennsylvanian) in the Allegheny basin [abs.]: International Congress

of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 151, **1979.**

See also Carothers, Marshall C., 2.

NOVAK, BILL

1. Devonian fossils along the Delaware River: Rocks and Minerals, v. 45, no. 10, p. 631-632, illus., **1970** [not seen].

NOVAK, ROBERT J.

1. (and Motto, H. L., and Douglas, L. A.). The effect of time and particle size on mineral alteration in several Quaternary soils in New Jersey and Pennsylvania, U.S.A., *in* Yaalon, D. H., ed., Paleopedology—Origin, nature and dating of paleosols: International Society of Soil Science and Israel Universities Press, Jerusalem, p. 211-224, illus., **1971.** Studies were made of soil profiles developed on the Martinsburg Formation and on Wisconsinan, Illinoian, and Kansan[?] drift derived from the Martinsburg, or on Martinsburg exposed by these glaciations. Soil development is correlated with time.

NOZAKI, Y.

1. (and DeMaster, D. J., Lewis, D. M., and others). Atmospheric ^{210}Pb fluxes determined from soil profiles: Journal of Geophysical Research, v. 83, no. C8, p. 4047-4051, illus., **1978** [not seen].

NUHFER, E. B.

1. (and Anderson, R. Y.). Internal geochemical calibration of sediment traps to estimate true annual sediment flux rates in lakes [Edinboro Lake, Erie County] [abs.]: West Virginia Academy of Science Proceedings, v. 50, no. 1, p. 39, **1978.**

NUMMEDAL, DAG, *see* Walton, John C., 1.

NUTTER, LARRY J.

1. Hydrogeology of Antietam Creek basin: Journal of Research of the U.S. Geological Survey, v. 2, no. 2, p. 249-252, illus., **1974.** The relationship between groundwater runoff and surface runoff within the basin was evaluated, and the role of the thick residual mantle on the east margin of the basin in storing groundwater and transmitting it to the underlying carbonate rocks was investigated.

O'BRIEN, PHILIP J.

1. Aquifer transmissivity distribution as reflected by overlying soil temperature patterns: University Park, Pennsylvania State University, Ph.D. thesis, **1970;** [abs.], Dissertation Abstracts International, v. 32, no. 2, p. 1026B, **1971.**

O'CONNOR, BRUCE J.

1. Garnet and biotite compositions in pelitic schists near the staurolite-breakdown isograd at Philadelphia, Pennsylvania and Waterbury, Connecticut: implications for the origin of garnet zoning [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 662-663, **1971.**
2. A model for the staurolite-disappearance isograd: examples from Waterbury, Connecticut and Philadelphia, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 5, p. 424-425, **1973.**

3. A petrologic and electron-microprobe study of pelitic mica schists in the vicinity of the staurolite-disappearance isograd in Philadelphia, Pennsylvania and Waterbury, Connecticut: Baltimore, Johns Hopkins University, Ph.D. thesis, **1973**; [abs.], Dissertation Abstracts International, v. 34, no. 11, p. 5518B, **1974.**

OFFUTT, P. A., *see* Thompson, Allan M., 5.

OHLMACHER, G. C., *see* Davies, William E., 26.

OHMOTO, HIROSHI, *see* Howe, Stephen S., 1.

OIL AND GAS JOURNAL

1. Drilling spree hits Pennsylvania: Oil and Gas Journal, v. 71, no. 48, p. 90–91, illus., **1973.** The shortage of crude oil and natural gas increased the development of known oil and gas reservoirs. Seven gas fields and 16 gas pools were discovered in 1973. A list of discoveries is included.
2. Pennsylvania state wildcatting in past 5-year period totals 71 discoveries: Oil and Gas Journal, v. 75, no. 4, p. 86–87, illus., **1977.** Data are tabulated for 19 "significant" wildcat wells, including wells producing from the Oriskany, Medina, Onondaga, Little Falls (Gatesburg), and Gantz Formations in Armstrong, Cameron, Clearfield, Erie, Lycoming, McKean, Mercer, Venango, and Washington Counties, and dry holes in Bedford, Crawford, Erie, McKean, Pike, Somerset, and Tioga Counties.
3. Shallow-pool Pennsylvania gas well flows 18.6 MMcfd: Oil and Gas Journal, v. 75, no. 1, p. 102, **1977.** Report of a gas discovery in the Devonian of Washington County, and of five wildcat wells in Lycoming County.
4. Broader expanse seen for eastern overthrust: Oil and Gas Journal, v. 77, no. 42, p. 92, illus., **1979.** Seismic surveys showed that sedimentary rocks in the Appalachian Overthrust Belt may extend more than 100 miles further east than originally thought.

OKUMA, ANGELO

1. Geology of the carbonate rocks of Path Valley, Franklin County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Progress Report 179, scale 1:62,500, 1 sheet, **1970.** Exposed bedrock ranges from the Ordovician Beekmantown Group to the Lower Silurian Tuscarora Formation.

OLDHAM, DAVID W.

1. Analysis of the relationships between composition and the occurrence of bloating shales and clays in the Pennsylvanian System of western Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1979.**

O'LEARY, DENNIS W.

1. The form, structure, and evolution of the Allegheny Front in Centre County, Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1972**; [abs.], Dissertation Abstracts International, v. 33, no. 12, pt. 1, p. 5919B, **1973.**

OLEKSYSHYN, JOHN

1. Fossil plants from the anthracite coal fields of eastern Pennsylvania and their stratigraphic value [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 48, **1979.**

OLIVER, WILLIAM A., JR.

1. Endemism and evolution of Late Silurian to Middle Devonian rugose corals in eastern North America, *in* Sokolov, B. S., ed., Ancient Cnidaria: Novosibirsk,

Nauka Publishing House, v. 2, p. 148–160, illus., **1975.** The history of rugosan endemism in eastern North America is traced and the paleobiogeography of eastern North American assemblages is outlined. Pennsylvania is not mentioned, but is shown on the paleogeographic maps.

2. Biogeography of Late Silurian and Devonian rugose corals: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 22, no. 1, p. 85–135, illus., **1977.** Three marine faunal realms are recognized for Early and Middle Devonian time. Endemism of rugose corals increased from Late Silurian through Early Devonian time, and decreased to zero in early Late Devonian time. This Early Devonian endemism was probably caused by the presence of land barriers between America and Africa-Europe. Migration of corals began in early Middle Devonian time, and was greatest during late Middle Devonian time.

OLSEN, PAUL E.

1. (and Galton, P. M.). Triassic-Jurassic tetrapod extinctions: are they real?: Science, v. 197, no. 4307, p. 983–986, illus., **1977.** Terrestrial vertebrate fossils show that part of the Newark Supergroup of eastern United States, the Glen Canyon Group of southwestern United States, and the Upper Stormberg Group of southern Africa are Early Jurassic. This new correlation demonstrates that the supposed widespread tetrapod extinction at the Triassic-Jurassic boundary is an artifact of spurious correlation.

OLSON, ROBERT E.

1. Mine mouth power generation—a case history in two parts [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 1036–1037, **1976.**

OLSON, STORRS L.

1. (and Gillette, D. D.). Catalogue of type specimens of fossil vertebrates, Academy of Natural Sciences, Philadelphia—Part III: birds: Academy of Natural Sciences of Philadelphia Proceedings, v. 129, p. 99–100, **1978.**

O'MAHONEY, LAURENCE

1. Geologic factors affecting roof stability at the Dilworth coal mine, Greene County, Pennsylvania: Bethlehem, Pa., Lehigh University, M.S. thesis, **1978.**

ONASCH, CHARLES M.

1. The geology of the Hellam Hills, York County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1971.**

O'NEILL, BERNARD J., JR.

1. An industrial mineral conflict in northwestern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 60–61, **1974.**
2. Greater Pittsburgh Region construction aggregates: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 67, 60 p., illus., **1974.** A compilation of information on construction aggregates available in southwestern Pennsylvania.
3. Potential high-calcium limestone resources in the Mount Joy area, Lancaster County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 76, 18 p., illus. including geologic map, **1975.** Mapping in the Mount Joy area resulted in the discovery of potential large reserves of high-calcium limestones in the Annville Formation.
4. Greater Pittsburgh Region properties and uses of clays and shales: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 71, 71 p., illus., **1976.** Data are summarized for 383 clay shale samples that were collected from stratigraphic

units within the Pennsylvanian, Pennsylvanian-Permian, and Quaternary Systems, and information is included concerning location, thickness, type of material, unfired and fired properties, chemical analyses, and current or potential uses, based on test results.

5. Our mineral heritage—Hopewell Village: Pennsylvania Geology, v. 7, no. 3, p. 2–5, illus., **1976.** The history of Hopewell, one of the earliest iron works in Pennsylvania, is reviewed.
6. The distribution of limestones containing at least 90 percent $CaCO_3$ in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 50, Part 4, 2 p., 1 pl., scale 1:500,000, **1976.** A guide to geologic units in Pennsylvania that have the best potential as economic sources of high-calcium limestone.
7. Directory of the mineral industry in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 54, 3rd ed., 140 p., illus., **1977.** This directory is arranged alphabetically by commodity, and names and addresses of producers are given. A map of locations of active quarries, pits, underground mines, and plants where raw materials are produced is included.
8. (and Barnes, J. H.). Properties and uses of shales and clays, southwestern Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 77, 689 p., illus. including geologic map, **1979.** Four hundred thirteen clay and shale samples were collected and analyzed. Information on geologic formation, stratigraphic thickness, chemical analyses, and X-ray mineralogy is reported.

ORGANIST, G.

1. A study of the Honey Brook anorthosite country rock contact: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1978.**

OSGOOD, JOHN O.

1. Hydrocarbon dispersion in ground water: significance and characteristics: Ground Water, v. 12, no. 6, p. 427–438, illus., **1974**; National Ground Water Quality Symposium, 2nd, Proceedings, p. 99–110, illus., **1974.** Groundwater contamination resulting from hydrocarbon spills was investigated.
2. Ground water's role in water quality management: American Society of Civil Engineers Hydraulic Division Journal, v. 101, no. HY3, p. 517–521, **1975.** The Federal Water Pollution Control Act is summarized and its ramifications on groundwater quality and management in Pennsylvania are outlined.

OSWALD, DELBERT L.

1. A new phosphate species from Pennsylvania: Rocks and Minerals, v. 53, no. 3, p. 115, illus., **1978.** Matulaite, a new phosphate species, was identified in samples from the Bachman iron mine in Hellertown, Northampton County.

OTT, A. N.

1. (and Barker, J. L., and Growitz, D. J.). Physical, chemical, and biological characteristics of Conewago Lake drainage basin, York County, Pennsylvania: Pennsylvania Department of Environmental Resources, Office of Resources Management, Water Resources Bulletin 8, 96 p., illus., **1973.** A preimpoundment study was made of the physical, chemical, and biological conditions of the drainage basin in order to determine the relationship between the natural environment of the basin and the chemical quality of streamflow and its effect on lake productivity.

OVERBEY, W. K., JR.

1. Stress fields as indicated by fracture orientations; potential application to petroleum production, *in* Proceedings of the Fourth Symposium on the Development of

Petroleum Resources of Asia and the Far East, Volume I; Part 2, Documentation: United Nations Economic Committee for Asia and the Far East, Mineral Resources Development Series 41, p. 195–203, illus., **1972** [not seen].

See also Komar, C. A., 1; Rough, Robert L., 1.

OWENS, JAMES P.

1. (and Minard, J. P.). Geologic map of the surficial deposits in the Trenton area, New Jersey and Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–884, scale 1:48,000, **1975.** Quaternary and Tertiary deposits in eastern Bucks County are depicted.
2. (and Minard, J. P.). Upper Cenozoic sediments of the lower Delaware Valley and the northern Delmarva Peninsula, New Jersey, Pennsylvania, Delaware, and Maryland: U.S. Geological Survey Professional Paper 1067–D, p. D1–D47, illus., **1979.** Two periods of gravel sedimentation are outlined, one occurring in the Late Miocene and the other in the Late Pleistocene.

See also Drake, Avery A., Jr., 3.

PADOVANI, ELAINE R.

1. (and Shirey, S. B., and Simmons, Gene). Microcracks in amphibolite and granulite facies grade rocks from southeastern Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 18, p. 424–425, **1979.**

PAGE, L. V.

1. (and Shaw, L. C.). Floods of June 1972 in the Harrisburg area, Pennsylvania: U.S. Geological Survey Hydrologic Investigations Atlas HA–530, scale 1:24,000, **1973.** Hydrologic data relating to the depth and extent of flooding are presented. A flood-frequency graph is included.
2. (and Shaw, L. C.). Low-flow characteristics of Pennsylvania streams: Pennsylvania Department of Environmental Resources, Office of Resources Management, Water Resources Bulletin 12, 441 p., illus., **1977.** Low-flow and flow-duration data for Pennsylvania streams are presented in tabular form.

PALKOVICS, W. E.

1. (and Petersen, G. W., and Matelski, R. P.). Perched water table fluctuation compared to streamflow: Soil Science Society of America Proceedings, v. 39, no. 2, p. 343–348, illus., **1975.** Monitoring on Bald Eagle Mountain near State College during 1972 indicates that time of year and precipitation are the most significant factors affecting perched water table and streamflow levels and that response to these factors is direct.
2. (and Petersen, G. W.). Contribution of lateral soil water movement above a fragipan to streamflow: Soil Science Society of America Journal, v. 41, no. 2, p. 394–400, illus., **1977.** Monitoring on Bald Eagle Mountain near State College indicates that saturated water flow is the main mechanism of water movement and that the more poorly drained soils adjacent to streams contribute most to streamflow.

PALMER, ALFRED C.

1. Rare fossils in Schuylkill County: Pennsylvania Geology, v. 8, no. 4, p. 30–32, illus., **1977.** This new locality is important because it contains rarities for Pennsylvania. A location map is included.

PALMER, E. C.

1. (and Almes, R. G., D'Appolonia, E., and Michalopoulos, A. P.). Measurement and control of movement in a marginally stable slope—A case history, *in* International Symposium—The geotechnics of structurally complex formations: Volume I: Associazione Geotecnica Italiana, Capri, Italy, p. 371–386, illus., **1977.** Geologic reasons for the initiation of slope movement as a result of man-made alterations to a slope in western Pennsylvania are evaluated and remedial procedures are indicated.

PALMER, JOHN K.

1. (and MacNamara, E. E.). Some properties of a peat bog located in Pike County, Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 46, p. 117–121, illus., **1972.** Preliminary field and laboratory studies of a post-Pleistocene peat bog in the Pocono area of Pennsylvania are reported.

PALMER, THOMAS D., *see* Dunn, Pete J., 1.

PANTECH ENGINEERS, INC.

1. Big Scrubgrass Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 147, 331 p., unpaginated appendices, illus., **1973.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

PAONE, JAMES

1. (and Morning, J. L., and Giorgetti, Leo). Land utilization and reclamation in the mining industry, 1930–71: U.S. Bureau of Mines Information Circular 8642, 61 p., illus., **1974.** Statistics by state and by type of mining are presented. Pennsylvania ranked second in percentage of land utilized and seventh in percentage reclaimed.

PAPASPYROS, ATHANASIOS, *see* Platt, Lucian B., 1.

PARIZEK, RICHARD R.

1. Prevention of coal mine drainage problems by well dewatering [abs.]: Mining Engineering, v. 22, no. 9, p. 54, **1970.**
2. An environmental approach to land use in a folded and faulted carbonate terrane, *in* Nichols, D. R., and Campbell, C. C., eds., Environmental planning and geology [Symposium on Engineering Geology in the Urban Environment, 1969, San Francisco, Proceedings]: Washington, D.C., U.S. Geological Survey (U.S. Department of the Interior) and Office of Research and Technology (U.S. Department of Housing and Urban Development), p. 122–143, illus., **1971.** The geology of the Nittany and Penns Valleys, in the Valley and Ridge province, is reviewed, and ways in which the population affects the geology, through land use, are discussed.
3. Hydrogeologic framework of folded and faulted carbonates, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 9–75, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 9–75, illus., **1971** [includes articles by other authors, which are annotated separately]. A

thorough discussion of the hydrogeology of the Nittany, Penns, and Kishacoquillas Valleys. Detailed descriptions of the geologic setting, chemical and physical characteristics of the rocks, geomorphic history, and the structural, stratigraphic, and topographic factors that influence the hydrologic regime are included.

4. Impact of highways on the hydrogeologic environment, *in* Coates, D. R., ed., Environmental geomorphology [Annual Geomorphology Symposia Series, 1st, Binghamton, N. Y., 1970, Proceedings]: Binghamton, State University of New York, p. 150–199, illus., **1971**; parts reprinted *in* Coates, D. R., ed., Environmental geomorphology and landscape conservation—Volume III: Non-urban: Binghamton, State University of New York, p. 137–159, illus., **1973.** A discussion of the social, economic, physical, chemical, and biological influences that highways have on our environment.
5. Land use problems in carbonate terranes, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 135–180, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 135–180, illus., **1971** [includes articles by other authors, which are annotated separately]. Selected examples illustrate the effects of natural and man-induced stresses on carbonate terranes.
6. Prevention of coal mine drainage formation by well dewatering: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report 82, 73 p., illus., **1971.** Two hypothetical mines that had a certain roof area were considered. Systems using both three and five pumping wells were studied. Additional wells are believed to dramatically reduce leakage into the mines. Some mines may not be suitable for dewatering. The costs of this method can be considerably less than the costs for treating mine waters.
7. Remote sensing and other geophysical methods, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 101–105, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 101–105, illus., **1971.** Black-and-white photography and color photography were used to map irregularities in carbonate bedrock surfaces, as well as locate zones of increased permeability and conduit development in bedrock.
8. Sustained yield of wells in fracture[d] carbonate rocks, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 96–100, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 96–100, illus., **1971.** Well yields in highly anisotropic fractured carbonate rocks are closely related to the position of the water table and its relationship with the water-bearing zone(s).
9. (and Gold, D. P.). Water well explosion: a pollution hazard [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 1, p. 47, **1971.**
10. (and White, W. B., and Langmuir, Donald, eds.). Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, An-

nual Meeting, Washington, D. C., 1971, Guidebook, 183 p., illus., **1971;** Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, 183 p., illus., **1971.** A detailed and comprehensive discussion based primarily on work completed in the area of State College, Centre County. Individual articles are annotated separately.

11. Agnes, aftermath and the future [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 7, p. 621, **1972.**
12. (and Tarr, E. G.). Mine drainage pollution prevention and abatement using hydrogeological and geochemical systems: Symposium on Coal Mine Drainage Research, 4th, Pittsburgh, Pa., 1972, Papers, p. 56–82, illus., **1972.** Knowledge of the naturally occurring hydrogeologic and geochemical systems for each mine is required in attempting to control and abate mine drainage. These data can be incorporated into the engineering design for control and treatment of the mine waters, and will aid in reducing the costs of such treatment.
13. Nature and causes of land subsidence in karst terranes [abs.]: International Symposium on Land Subsidence, Symposium Program 2, unpaginated, **1976.**
14. On the nature and significance of fracture traces and lineaments in carbonate terranes, *in* Karst hydrology and water resources: United States-Yugoslavian Symposium, Dubrovnik, Yugoslavia, Proceedings, p. 47–108, **1976.** The author concludes that the utility of fracture traces has been demonstrated for carbonate rocks.
15. (and Buss, D. R.). Aquifer design and construction; a potential positive impact of surface mining [abs.]: Ground Water, v. 17, no. 5, p. 493, **1979.**

See also Alexander, Shelton S., 2; Bair, E. Scott, 2, 3; Brown, Robert L., 2; Bucek, Milena F., 3; Gerhart, James M., 3; Gold, David P., 1, 2, 3, 4, 5, 6; Hunter, P. M., 2; Krothe, Noel C., 3, 4; Mundi, Emmanuel K., 3; Schmotzer, J. K., 1; Siddiqui, Shamsul H., 2, 3, 4, 5.

PARMELE, LESLIE H., *see* Engman, Edwin T., 1, 2.

PARRIS, MARTHA

1. (and Squire, Anne, and Berger, Harlan, eds.). Research in the College of Earth and Mineral Sciences: Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 80, 52 p., illus., **1970** [not seen].

PARRISH, JAY B.

1. The relationship of geophysical and remote sensing lineaments to regional structure and kimberlite intrusions in the Appalachian Plateau of Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1978.**
2. (and Lavin, P. M.). The relationship of geophysical and remote sensing lineaments to regional structure and kimberlite intrusions in the Appalachian Plateau of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 48, **1979.**

PARROTT, WILLIAM R., JR.

1. Glen Mills quarry, *in* Amenta, R. V., and others, Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, p. 22–27, illus., **1974.** The lithology, mineralogy, and structure of this large southeastern Pennsylvania quarry are reviewed.

See also Amenta, Roddy V., 4.

PARSONS, ROGER C., *see* Dahl, H. D., 1.

PARTOS, A.

1. (and Koerner, R. M.). Monitoring consolidation settlements of soft soils induced by dewatering: American Society for Testing and Materials Special Technical Publication 5, p. 111–126, illus., **1975** [not seen].

PATCHEN, D. G.

1. (and Smosna, R., and Buchanan, H.). Stratigraphy and petrology of Middle Silurian McKenzie (Lockport) Formation in West Virginia and adjacent areas [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1894, **1974.**

See also Heald, M. T., 1.

PATTERSON, ELMER D.

1. (and Van Lieu, J. A.). Coal resources of Butler County, Pennsylvania: U.S. Geological Survey Bulletin 1143-C, p. C1–C43, illus. including geologic map, **1971.** The distribution, thickness, and resources of the coal beds in the Pottsville, Allegheny, and Conemaugh Groups are reported.
2. (and Van Lieu, J. A.). Geologic and coal-bed map of Clarion County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-715, scale 1:62,500, **1972.** Approximate stratigraphic intervals between coal beds are given.

PATTERSON, J. L., *see* Bailey, J. F., 1.

PAULHUS, JOSEPH L. H., *see* Bailey, J. F., 1.

PAULSON, RICHARD W.

1. The role of remotely sensed and relayed data in the Delaware River basin, *in* Earth resources survey systems: U.S. National Aeronautics and Space Administration, Washington, D. C., v. 2, p. 449–457, illus., **1971** [not seen].
2. The role of remotely sensed and relayed data in the Delaware River basin, *in* Geological Survey research 1971—Chapter C: U.S. Geological Survey Professional Paper 750-C, p. C196–C201, illus., **1971.** An experiment is being conducted to significantly reduce the transmittal time of riverine and estuarine data from U.S. Geological Survey monitoring stations to water resources agencies through the use of radiotelemetry and the Earth Resources Technology Satellite.

PAXTON, STANLEY T., *see* Hower, James C., 5.

PAYNE, MICHAEL A.

1. (and Shulik, S., Cain, B., Schmidt, V. A., Donahue, J. D., and Rollins, H. B.). A Pennsylvanian (Conemaughian) pole position for the Brush Creek Limestone from western Pennsylvania, USA [abs.]: EOS (American Geophysical Union Transactions), v. 59, no. 4, p. 264, **1978.**
2. The origin of the magnetization of various lithologies from the lower Conemaugh Group in southwestern Pennsylvania: University of Pittsburgh, Ph.D. thesis, **1979.**
3. (and Schmidt, V. A.). Paleomagnetic poles and remanence characteristics of cyclothemic sediments from the Appalachian basin [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 18, p. 236, **1979.**

See also Cain, Bruce, 2.

PEACOR, DONALD R., *see* Dunn, Pete J., 1.

PEAK, JOHN R., *see* Bushnell, Kent, 5.

PEARL, RICHARD M.

1. Geotravels by the geologic observer: Gettysburg battlefields: Earth Science, v. 31, no. 2, **1978.** Few historical events have been so closely influenced by the geologic nature of the landscape. A summary of the battle, which lasted six weeks and covered an area of 11,000 square miles, is given.

PEARSON, F. J., JR., *see* Hobba, W. A., Jr., 1.

PEDERSEN, T. A.

1. (and Rogowski, A. S., and Pennock, R., Jr.). Comparison of morphological and chemical characteristics of some soils and minesoils: Reclamation Review, v. 1, no. 3-4, p. 143-145, illus., **1978** [not seen].
2. (and Rogowski, A. S., and Pennock, R., Jr.). Comparison of some properties of minesoils and contiguous natural soils: [U.S. Environmental Protection Agency] Report EPA-600/7-78-162, 141 p., illus., **1978** [not seen].

PEDLOW, GEORGE W., III

1. (and Knight, F. J.). Acid mine drainage abatement at Catawissa Creek, Pennsylvania [abs.]: Association of Engineering Geologists, Annual Meeting, Program and Abstracts, p. 19-20, **1970.**
2. (and Mathew, David, and Staub, J. R.). A peat island model for the formation of thick Appalachian coals [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 7, p. 469, **1978.**
3. A depositional analysis of the anthracite coal basins of Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 530-542, illus., **1979.** The basic sedimentation pattern of the anthracite region is described as being mainly regressive; two transgressive interruptions are evident in the Pocono Formation and higher in the section in the Mill Creek Limestone. The interpreted depositional environments are alluvial fan, alluvial plain with coal, alluvial plain without coal, tidal flat, and barrier island.

See also Ferm, John C., 7; Mathew, David, 1.

PEECHATKA, W. N., *see* Cunningham, Robert L., 1.

PELL, J.

1. The prospect for anthracite as a natural energy resource, *in* Hill, R. F., ed., Proceedings of the Sixth Energy Technology Conference— "Achievements in perspective": Energy Technology Conference, 6th, Proceedings, p. 539-550, **1979** [not seen].

PENNINGTON, D. L.

1. Chromium and nickel in soil as geochemical indicators for chromite deposits in the State Line district, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1973.**
2. (and Rose, A. W.). Chromium and nickel in soil as geochemical indicators for chromite deposits in the State Line district, Pennsylvania [abs.]: Mining Engineering, v. 25, no. 8, p. 32, **1973.**
3. (and Rose, A. W.). Chromium and nickle [sic] in soil as geochemical indicators for chromite deposits in the State Line district, Pennsylvania: Pennsylvania Geology, v. 5, no. 1, p. 11, **1974.**
4. Relationship of ground-water movement and strip mine reclamation: Symposium on Surface Mining and Reclamation, 3rd, Louisville, Ky., 1975, National Coal

Association, Papers, v. 1, p. 170–178, illus., **1975.** Methods of reducing acid mine drainage in the Mahanoy Creek watershed are discussed. Strip mine reclamation, a method commonly used to decrease infiltration of water into the underground mine pools and thereby reduce acid mine drainage, is shown to be inadequate because of the complex nature of groundwater movement through the interconnected mine pools and overlying aquifers, some extending outside the watershed.

PENNOCK, R., JR., *see* Cunningham, Robert L., 1; Pedersen, T. A., 1, 2.

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES, OFFICE OF ENGINEERING AND CONSTRUCTION

1. Long-duration low flow of Pennsylvania streams: Pennsylvania Department of Environmental Resources, Office of Engineering and Construction [now Office of Resources Management], Water Resources Bulletin 7, 207 p., illus., **1972.** Monthly average streamflow data from 143 gaging stations were analyzed to develop low-flow frequency of durations ranging from 2 to 60 months, and to examine yield-storage-frequency relationships.

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES, OFFICE OF RESOURCES MANAGEMENT

1. Blacklegs Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 182, 79 p., illus., **1974.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. Mine drainage pollution abatement measures for the Cogley Run watershed study: Pennsylvania Department of Environmental Resources, Operation Scarlift Project, 61 p., illus., **1974.** See annotation in entry 1 above.
3. Mine drainage pollution abatement measures for the Mead Run watershed study: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 132-6, 85 p., illus., **1974.** See annotation in entry 1 above.
4. North Branch Bear Creek watershed study—mine drainage pollution abatement: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 199, 66 p., illus., **1975.** See annotation in entry 1 above.
5. The State Water Plan—Subbasin 5, Upper Central Susquehanna River: Pennsylvania Department of Environmental Resources, Office of Resources Management, Bulletin SWP-6, 197 p., illus. including geologic map, **1978.** The physical features, water quantity and quality, flood damage reduction, water-related outdoor recreation, and environmental quality of the subbasin are examined.
6. The State Water Plan—Subbasin 4, Upper Susquehanna River: Pennsylvania Department of Environmental Resources, Office of Resources Management, Bulletin SWP-5, 172 p., illus. including geologic map, **1979.** See annotation in entry 5 above.
7. The State Water Plan—Subbasin 8, Upper West Branch Susquehanna River: Pennsylvania Department of Environmental Resources, Office of Resources Management, Bulletin SWP-9, 146 p., illus. including geologic map, **1979.** See annotation in entry 5 above.
8. The State Water Plan—Subbasin 10, Lower West Branch Susquehanna River: Pennsylvania Department of Environmental Resources, Office of Resources Management, Bulletin SWP-11, 156 p., illus. including geologic map, **1979.** See annotation in entry 5 above.

9. The State Water Plan—Subbasin 12, Upper Juniata River: Pennsylvania Department of Environmental Resources, Office of Resources Management, Bulletin SWP-13, 127 p., illus. including geologic map, **1979.** See annotation in entry 5 above.
10. The State Water Plan—Subbasin 13, Potomac River: Pennsylvania Department of Environmental Resources, Office of Resources Management, Bulletin SWP-14, 119 p., illus. including geologic map, **1979.** See annotation in entry 5 above.
11. The State Water Plan—Subbasin 15, Lake Erie: Pennsylvania Department of Environmental Resources, Office of Resources Management, Bulletin SWP-15, 98 p., illus. including geologic map, **1979.** See annotation in entry 5 above.

PENNSYLVANIA DEPARTMENT OF FORESTS AND WATERS

1. Dams, reservoirs and natural lakes—Water Resources Planning Inventory No. 1: Pennsylvania Department of Forests and Waters [now Department of Environmental Resources] Water Resources Bulletin 5, 101 p., illus., **1970.** An atlas organized by drainage basins, showing the locations of dams, reservoirs, and natural lakes.

PENNSYLVANIA GEOLOGICAL SURVEY

1. Oil and gas well base map of the Corry, Tidioute, Titusville, and Youngsville 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 16, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
2. Oil and gas well base map of the Kane, Kinzua, Sheffield, and Warren 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 17, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
3. Oil and gas well base map of the Clarion, Foxburg, Oil City, and Tionesta 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 18, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
4. Oil and gas well base map of the Brookville, DuBois, Hallton, and Marienville 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 19, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
5. Oil and gas well base map of the Zelienople, Butler, Sewickley, and New Kensington 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 21, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
6. Oil and gas well base map of the Kittanning, Rural Valley, Freeport, and Elders Ridge 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 22, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
7. Oil and gas well base map of the Smicksburg, Punxsutawney, Indiana, and Barnesboro 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 23, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
8. Oil and gas well base map of the Greensburg, Latrobe, Connellsville, and Donegal 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 24, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
9. Oil and gas well base map of the Carnegie, Pittsburgh, Amity, and Brownsville 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 25, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
10. Oil and gas well base map of the Stoneboro, Franklin, Mercer, and Hilliards 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 26, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
11. Oil and gas well base map of the Shenango, Neshannock, and Pennsylvania portion of the Kinsman and Youngstown 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 28, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].

12. Oil and gas well base map of the New Castle, Beaver, and Pennsylvania portion of the Columbiana and Wellsville 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 29, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
13. Oil and gas well base map of the Burgettstown, Claysville, and Pennsylvania portion of the Steubenville and Wheeling 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 30, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
14. Oil and gas well base map of the Rogersville 15′ quadrangle and the Pennsylvania portion of the Mannington and Cameron 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 31, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
15. Oil and gas well base map of the Waynesburg, Masontown, and Pennsylvania portion of the Blacksville and Morgantown 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 32, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
16. Oil and gas well base map of the New Florence, Johnstown, Somerset, and Windber 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 33, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
17. Oil and gas well base map of the Uniontown, Confluence, and Pennsylvania portion of the Bruceton Mills and Accident 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 34, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
18. Oil and gas well base map of the Meyersdale, Berlin, and Pennsylvania portion of the Grantsville and Frostburg 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 35, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
19. Oil and gas well base map of the Coudersport, Genesee, Emporium, and Conrad 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 36, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
20. Oil and gas well base map of the Ebensburg, Hollidaysburg, Bedford, and Everett 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 37, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
21. Oil and gas well base map of the Hyndman, Clearville, and Pennsylvania portion of the Flintstone and Paw Paw 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 40, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
22. Oil and gas well base map of the Bradford, Smethport, Mt. Jewett, and Crosby 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 46, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
23. Oil and gas well base map of the Gaines, Elkland, Galeton, and Antrim 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 47, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
24. Oil and gas well base map of the Fairview, Erie, and North East 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 50, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
25. Oil and gas well base map of the Girard, Linesville, and Pennsylvania portion of the Conneaut and Andover 15′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 51, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].

26. Oil and gas well base map of the Cambridge Springs, Union City, Meadville, and Townville 15 ′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 52, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
27. Oil and gas well base map of the Ridgway, Benezette, Penfield, and Clearfield 15 ′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 53, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
28. Oil and gas well base map of the Curwensville, Houtzdale, Patton, and Altoona 15 ′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 54, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
29. Oil and gas well base map of the Philipsburg, Bellefonte, Tyrone, and Allensville 15 ′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 55, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
30. Oil and gas well base map of the Driftwood, Renovo West, Karthaus, and Snow Shoe 15 ′ quadrangles: Pennsylvania Geological Survey, 4th ser., Map 56, scale 1:62,500, ozalid print, revised periodically [out of print, 1985].
31. Columnar jointing in South Mountain: Pennsylvania Geology, v. 1, no. 2, p. 7, illus., **1969.** Well-preserved columnar joints have been discovered in the ancient, metamorphosed volcanic rocks of South Mountain in Franklin County.
32. DuBois basin core drilling provides new coal data: Pennsylvania Geology, v. 1, no. 2, p. 6, **1969.** A brief report of four deep core holes drilled by the Pennsylvania Geological Survey to provide information on the nature and economic potential of the deep coals and other strata along the DuBois basin (southeastern Jefferson County and northwestern Clearfield County).
33. Geology garden grows in Allentown: Pennsylvania Geology, v. 1, no. 2, p. 2, illus., **1969.** A garden, designed and built by the Lehigh County Cultural Center, provides an outdoor tour of the rocks of Lehigh County.
34. Medicine and industry look at Pennsylvania's brines: Pennsylvania Geology, v. 1, no. 3, p. 3, **1969.** Underground salt deposits in northwestern Pennsylvania have been examined for medical and commercial purposes.
35. Pennsylvania mineral industry shows gains: Pennsylvania Geology, v. 1, no. 2, p. 3, **1969.** A brief report on Pennsylvania's mineral production, which increased in 1968 to a value of 904 million dollars. Major gains were made in cement, stone, copper, clay, iron ore, and sand and gravel production.
36. Fossils from "Down Under" found in Pennsylvania: Pennsylvania Geology, v. 1, no. 8, p. 12, illus., **1970.** Fossils similar to ancient jellyfish, first discovered in South Australia, have been found in the Shawangunk Formation in the Delaware Water Gap.
37. Future deep drilling in Pennsylvania: Pennsylvania Geology, v. 1, no. 4, p. 5, illus., **1970.** A brief report on successful gas exploration in Cambrian and Lower Ordovician rocks in eastern Ohio and the possibility of renewed deep drilling in the same strata in western Pennsylvania.
38. Geological research in Pennsylvania, 1970: Pennsylvania Geology, v. 1, no. 7, p. 2–28, illus., **1970.** Annual compilation of current research and reports published on the geology of Pennsylvania.
39. Ground water program in Pennsylvania: Pennsylvania Geology, v. 1, no. 5, p. 2–4, illus., **1970.** An overview of the groundwater program of the Pennsylvania Geological Survey, in cooperation with the U.S. Geological Survey, for the past 50 years, and a brief note on the present activities and future of the program.
40. Water yielding capability of rocks of Pennsylvania: Pennsylvania Geological Survey, 4th ser., Map 20, **1970.** On this page-sized (9- by 12-inch) map, estimated

median yields of bedrock units are shown in five colors, each color representing a group of several formations that have the same median yield.

41. Bradford, the first giant oil field: Pennsylvania Geology, v. 2, no. 4, p. 34–36, **1971.** The development of the 100,000-acre oil field located in McKean County, Pennsylvania, and Cattaraugus County, New York, is reviewed. Included are the different waterflooding recovery methods employed and figures on yearly output of oil.
42. Geological research in Pennsylvania, 1971: Pennsylvania Geology, v. 2, no. 4, p. 2–28, 29–32, illus., **1971.** See annotation in entry 38 above.
43. Industrial minerals produced in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Map 27, unscaled, **1971.** Commodities are listed by county on an outline map. Includes nonmetals and metals; does not include fuels.
44. Marafloods in Pennsylvania: Pennsylvania Geology, v. 2, no. 2, p. 9, **1971.** Water was used to flood wells in Warren County that previously produced gas. Mixing water and oil was the preferential oil displacement process.
45. Pennsylvania mineral industry continues growth: Pennsylvania Geology, v. 2, no. 5, p. 2–3, **1971.** The mineral industry of Pennsylvania is the fifth largest in the nation; production in 1969 is reviewed.
46. A picture story of the flood: Pennsylvania Geology, v. 3, no. 4, p. 3–20, illus., **1972.** The devastation of the quarters of the Pennsylvania Geological Survey following tropical storm Agnes is shown in a series of photographs.
47. A new Triassic copper occurrence at Rossville [York County], Pa.: Pennsylvania Geology, v. 4, no. 1, p. 6–7, **1973.** An occurrence of malachite and azurite is examined and analyses are reported.
48. Considerable Cumberland County crystal: Pennsylvania Geology, v. 4, no. 6, p. 4, illus., **1973.** An 8-inch-long, 8½-pound quartz crystal was found near New Kingston. Possible reasons for the development of such a large crystal are presented.
49. Geological research in Pennsylvania, 1973: Pennsylvania Geology, v. 4, no. 4, p. 2–29, illus., **1973.** See annotation in entry 38 above.
50. Geology and wildlife management: Pennsylvania Geology, v. 4, no. 5, p. 2–3, illus., **1973.** The cooperation between the Pennsylvania Geological Survey and the Pennsylvania Game Commission during the construction of the Middle Creek Wildlife Management Area is reviewed.
51. Pennsylvania loses a nationally-known scientist: Pennsylvania Geology, v. 4, no. 6, p. 5–6, illus., **1973.** Memorial to Bradford Willard.
52. Pennsylvania mineral production up: Pennsylvania Geology, v. 4, no. 1, p. 10, **1973.** A very brief review of mineral production in Pennsylvania in 1972.
53. Satellite to eye resources and pollution: Pennsylvania Geology, v. 4, no. 1, p. 12, **1973.** Summary of plans to make a satellite a new environmental watchdog.
54. Topographic map of Lehigh County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Map 39, scale 1:50,000, **1973.** Map on one sheet (scale approximately 1.25 inches equals 1 mile) shows contours at 20-foot interval; green tint for wooded areas; pink tint for built-up areas; and roads, streams, and other cultural features.
55. A new fossil collecting locality: Pennsylvania Geology, v. 5, no. 3, p. 15–16, illus., **1974.** A Schuylkill County collecting locality for Devonian Period marine fossils is reviewed. A location map is included.
56. Geological research in Pennsylvania, 1974: Pennsylvania Geology, v. 5, no. 4, p. 2–30, illus., **1974.** See annotation in entry 38 above.

57. Limestone and dolomite distribution in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Map 15, 2nd ed., **1974.** A two-color page-sized (8½- by 11-inch) map.
58. 1973—a good year for the mineral industry of Pennsylvania: Pennsylvania Geology, v. 5, no. 2, p. 10, **1974.** A brief summary of mineral production in Pennsylvania in 1973.
59. Publications in press [part of *Geological research in Pennsylvania, 1974*]: Pennsylvania Geology, v. 5, no. 5, p. 13–16, **1974.** See annotation in entry 38 above.
60. The well driller's hidden tool—the ground-water report: Pennsylvania Geology, v. 5, no. 6, p. 9–10, illus., **1974.** A discussion of the value of the Survey's ground-water publications to water well drillers.
61. Walter Richard Wagner (1928–1974): Pennsylvania Geology, v. 5, no. 6, p. 2–3, illus., **1974.**
62. Base map of Pennsylvania: Pennsylvania Geological Survey, 4th ser., Map 41, scale 1:250,000, 2 sheets, **1975.** Culture, drainage, and county and township boundaries are shown.
63. Controlling sediment: Pennsylvania Geology, v. 6, no. 3, p. 3–4, illus., **1975.** Techniques of limiting the amount of sediment discharge at construction sites along Interstate Route 81 west of Harrisburg are discussed briefly.
64. Deepest well in Appalachian basin: Pennsylvania Geology, v. 6, no. 1, p. 16, **1975.** A very brief description of the No. 1 Leonard Svetz well, completed in 1974 in Somerset County at a total depth of 21,460 feet.
65. Geological research in Pennsylvania, 1975: Pennsylvania Geology, v. 6, no. 4, p. 2–30, illus., **1975.** See annotation in entry 38 above.
66. Geologic map of the greater Harrisburg area: Pennsylvania Geological Survey, 4th ser., Map 48, scale 1:125,000, **1975.** This 14- by 13-inch map shows the distribution of the major bedrock units. Areas underlain by limestone, shale, sandstone, and diabase are shown.
67. The ground-water program for Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 7, 2nd ed., 13 p., illus., **1975.** A summary of the purpose, history, present status, and future plans of the program. Included is an index of regional reports, a map of the observation well network, and descriptions of ongoing projects.
68. Thorium-uranium occurrence in Hardyston Formation: Pennsylvania Geology, v. 6, no. 3, p. 9, **1975.** A very brief account of a 24-inch-thick radioactive zone found at the base of the Lower Cambrian Hardyston Formation in Lehigh County.
69. From our mineral collection—to the Queen: Pennsylvania Geology, v. 7, no. 5, p. 2, **1976.** A cluster of quartz crystals from the collection of the Pennsylvania Geological Survey was presented to Queen Elizabeth II of Great Britain during her bicentennial visit to the United States.
70. Geological research in Pennsylvania, 1976: Pennsylvania Geology, v. 7, no. 4, p. 2–31, illus., **1976.** See annotation in entry 38 above.
71. Multiple land use: Pennsylvania Geology, v. 7, no. 5, p. 16, illus., **1976.** An abandoned quarry near Millardsville, Lebanon County, has been turned into a private swim club and training area for scuba divers.
72. Dr. John Moss: Pennsylvania Geology, v. 8, no. 5, p. 2, **1977.** A tribute to a distinguished geologist and outstanding teacher.
73. Geological research in Pennsylvania, 1977: Pennsylvania Geology, v. 8, no. 4, p. 2–27, illus., **1977.** See annotation in entry 38 above.
74. Prominent limestone in Mifflin County: Pennsylvania Geology, v. 8, no. 1, p. 11, illus., **1977.** A rock promontory along the Juniata River near Newton Hamilton

is unusual because it is made of limestone. Reasons for the anomalous exposure are discussed.

75. Erie gas field redefined: Pennsylvania Geology, v. 9, no. 1, p. 9, **1978.** The limits of the Erie gas field (Erie County) have been redefined due to the large increase in the number of gas wells completed in an area formerly considered noncommercial, in order to avoid a proliferation of new field and pool names.
76. Geological research in Pennsylvania, 1978: Pennsylvania Geology, v. 9, no. 4, p. 2–26, illus., **1978.** See annotation in entry 38 above.
77. Uranium near Oley, Berks County: Pennsylvania Geology, v. 9, no. 4, p. 29–31, illus., **1978.** Uranium was discovered near the headwaters of Monocacy Creek in outcrops of Precambrian gneiss.
78. Water data relay by commercial satellite to be tested: Pennsylvania Geology, v. 9, no. 1, p. 14–15, illus., **1978.** Report on a six-month study to be conducted by the U.S. Geological Survey and COMSAT General Corporation (starting October 1977) to relay water data from 11 stream-monitoring stations via a commercial communication satellite to the U.S. Geological Survey computers. Five of the test stations are in Pennsylvania. Uses for the data to be gathered are discussed briefly.
79. Geological research in Pennsylvania, 1979: Pennsylvania Geology, v. 10, no. 4, p. 2–30, illus., **1979.** See annotation in entry 38 above.
80. Some interesting notes on the minerals industry of Pennsylvania: Pennsylvania Geology, v. 10, no. 1, p. 2–4, illus., **1979.** The information presented for the year 1977 shows Pennsylvania to be first among the states in production of anthracite coal and stone, second in lime, masonry cement, and fire clay, and third in portland cement, bituminous coal, and peat.

PENNSYLVANIA STATE UNIVERSITY, *see* Michael Baker, Jr., Inc., 2.

PERRY, R. M., *see* West, L. J., 1.

PERRY, WILLIAM J., JR.

1. Sequential deformation in the central Appalachians: American Journal of Science, v. 278, no. 4, p. 518–542, illus., **1978.** The discussion of the deformational sequence for the central Appalachians is based on the following: (1) the décollements step upward from east to west; (2) Alleghanian deformation is progressively more intense and complex southeastward; and (3) faulting and folding are closely interrelated kinematically, dynamically, and temporally.

See also de Witt, Wallace, Jr., 7.

ALBERT E. PETERS ASSOCIATES

1. Lackawanna River mine drainage pollution abatement project—Part II: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 139-1, pt. 2, 207 p., illus., **1978.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

PETERSEN, GARY W.

1. (and Ranney, R. W., Cunningham, R. L., and Matelski, R. P.). Fragipans in Pennsylvania soils—A statistical study of laboratory data: Soil Science Society of America Proceedings, v. 34, no. 5, p. 719–722, illus., **1970.** Fragipan horizons were compared to nonfragipan horizons from comparable depths to determine statistically soil properties related to fragipan occurrence. Data were analyzed

for 773 samples from 254 soil profiles.

See also Ciolkosz, Edward J., 2, 3; Cunningham, Robert L., 1; Henninger, D. L., 1; Mathews, H. L., 2; May, G. A., 1; Palkovics, W. E., 1, 2; Ranney, Richard W., 1, 2.

PETRUS, CAROLYN A.

1. Investigation of exit areas of ground water related to anthracite deep mines [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 105, **1975.**
2. Investigation of fracture traces and underground roof fall fatalities in the Southern Anthracite field, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1979.**

PETTIJOHN, F. J.

1. (and Potter, P. E., and Siever, Raymond). Central Appalachian geosyncline, *in* Pettijohn, F. J., and others, Sand and sandstone: New York, Springer-Verlag, p. 556–561, illus., **1972.** The sandstones of the central Appalachians are described in relation to the evolution and deformation of the geosyncline.

See also Cloos, Ernst, 2.

PFANN, H. DICKMAN

1. Stratigraphy, petrography, and source of the Lost Run Conglomerate Member of the Bald Eagle Formation: Lewisburg, Pa., Bucknell University, Senior thesis, **1972.**

PFEFFERKORN, HERMANN W.

1. (and Gillespie, W. H.). Plant megafossils in the proposed Pennsylvanian System stratotype [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 162, **1979.**

PHELPS, L. BARRY

1. Some relationships between stripmining and groundwater: Earth and Mineral Sciences, v. 47, no. 9, p. 65–68, illus., **1978.** The impact of strip mining on groundwater must be analyzed for each location, and provisions must be made to protect and replenish the groundwater.

PHILBRICK, SHAILER S.

1. Kinzua Dam and the glacial foreland, *in* Coates, D. R., ed., Geomorphology and engineering: Stroudsburg, Pa., Dowden, Hutchinson and Ross, Inc., p. 175–197, illus., **1976.** Pleistocene glaciation has changed the course of several streams in the area of the Kinzua Dam. This made site selection and dam engineering difficult.

PHILLEO, MARGARET L.

1. Regional joint patterns in the Allegheny Plateau and Valley and Ridge province of central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 48, **1979.**

PHILLIPS, J. D., *see* Podwysocki, M. H., 2.

PICKETT, T. E., *see* Jordan, R. R., 1, 2.

PIERCE, NORMAN A.

1. The Rogers brothers and Lyell: Pennsylvania Geology, v. 9, no. 5, p. 7–14, illus., **1978.** Lyell's visit to Pennsylvania in the 1800's, as recorded by Henry and William Rogers, is reviewed.

PIERCE, VICKI L. F.

1. Ground water: location and development, *in* Freedman, J. L., ed., "Lots" of danger—Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, p. 29–40, illus., **1977.** Because of pollution of surface-water supplies, alternative sources need to be located. Locating subsurface water and predicting its quality and quantity are major concerns.

PIMENTEL, NELLY R.

1. Potassium-argon age determination of a mica-peridotite dike in western Pennsylvania: University of Pittsburgh, M.S. thesis, **1971.**
2. (and Bikerman, Michael, and Flint, N. K.). A new K-Ar date on the Masontown dike, southwestern Pennsylvania: Pennsylvania Geology, v. 6, no. 3, p. 5–7, illus., **1975.** The Masontown dike is one of two known igneous intrusions in southwestern Pennsylvania. A study was undertaken to determine whether a geologically reasonable K-Ar date could be established for a carefully selected and separated mica sample from the dike.

PIOTROWSKI, ROBERT G.

1. Reef hunting in McKean County continues: Pennsylvania Geology, v. 7, no. 1, p. 2–3, illus., **1976.** Exploration of "pinnacle reefs" in McKean County, north-central Pennsylvania, led to the discovery of natural gas.
2. (and Krajewski, S. A.). Devonian shale research in Pennsylvania, *in* Lytle, W. S., and others, Oil and gas developments in Pennsylvania in 1976: Pennsylvania Geological Survey, 4th ser., Progress Report 190, p. 33–42, illus., **1977.** Summary information from a study that was designed to evaluate the Devonian black shales and to develop techniques to increase gas production.
3. (and Krajewski, S. A.). Drilling depth map to the top of the Middle Devonian Onondaga Group: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 10, scale 1:250,000, 3 sheets, **1977.** Large map shows drilling depth by 500-foot contour interval and all wells penetrating the Onondaga for the area west and north of the Allegheny Front.
4. (and Krajewski, S. A.). Gas show and production map from Middle and Upper Devonian organic rich shales in western and northern Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 11, scale 1:250,000, 3 sheets, **1977.** Large map showing locations of wells; horizons of show, production, or penetration; and outlines and names of gas fields.
5. (and Krajewski, S. A.). Preliminary stratigraphic cross section (A1–A4) showing radioactive black shale zones and sandstones in the Middle and Upper Devonian, western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 9, 2 sheets, **1977.** Large chart shows gamma-ray logs, correlations, and generalized rock types for eight wells in southwestern Pennsylvania. The Marcellus Formation is the datum base.
6. (and Krajewski, S. A.). Preliminary stratigraphic cross section (A2–D2) showing radioactive black shale zones and sandstones in the Middle and Upper Devonian, western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 3, 2 sheets, **1977.** Large chart shows gamma-ray logs, correlations, and generalized rock types for nine wells on a north-south line in western Pennsylvania. The Marcellus Formation is the datum base.
7. (and Krajewski, S. A.). Preliminary stratigraphic cross section (A3–D3) showing radioactive black shale zones and sandstones in the Middle and Upper Devonian, western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 2, 2 sheets, **1977.** Large chart shows gamma-ray logs, correlations, and generalized rock types for nine wells on a north-south line in western Pennsylvania. The Marcellus Formation is the datum base.

8. (and Krajewski, S. A.). Preliminary stratigraphic cross section (B1–B4) showing radioactive black shale zones and sandstones in the Middle and Upper Devonian, western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 7, 2 sheets, **1977.** Large chart shows gamma-ray logs, correlations, and generalized rock types for nine wells on an east-west line in western Pennsylvania. The Marcellus Formation is the datum base.
9. (and Krajewski, S. A.). Preliminary stratigraphic cross section (C1–C3) showing radioactive black shale zones and sandstones in the Middle and Upper Devonian, western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 1, 2 sheets, **1977.** Large chart shows gamma-ray logs, correlations, and generalized rock types for nine wells on an east-west line in northwestern Pennsylvania. The Marcellus Formation is the datum base.
10. (and Krajewski, S. A.). Preliminary stratigraphic cross section (D1–D3) showing radioactive black shale zones and sandstones in the Middle and Upper Devonian, western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 8, 2 sheets, **1977.** Large chart shows gamma-ray logs, correlations, and generalized rock types for nine wells on an east-west line in northwestern Pennsylvania. The Marcellus Formation is the datum base.
11. (and Krajewski, S. A.). Preliminary stratigraphic cross section (D3–D4) showing radioactive black shale zones and sandstones in the Middle and Upper Devonian, western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 6, 2 sheets, **1977.** Large chart shows gamma-ray logs, correlations, and generalized rock types for nine wells on an east-west line in north-central Pennsylvania. The Marcellus Formation is the datum base.
12. Devonian shale gas—New interest in old resource: Pennsylvania Geology, v. 9, no. 1, p. 2–5, illus., **1978.** The Devonian organic-rich black shales were reevaluated for possible natural gas production in western Pennsylvania.
13. (and Cozart, C. L.). Pennsylvania, *in* Patchen, D. G., and others, Oil and gas developments in Maryland, Ohio, Pennsylvania, Virginia, and West Virginia in 1978: American Association of Petroleum Geologists Bulletin, v. 63, no. 8, p. 1245–1248, 1254–1263, 1275, **1979.**
14. (and Cozart, C. L., Heyman, Louis, Harper, J. A., and Abel, K. D.). Oil and gas developments in Pennsylvania in 1978: Pennsylvania Geological Survey, 4th ser., Progress Report 192, 61 p., illus., **1979.**
15. (and Harper, J. A.). Black shale and sandstone facies of the Devonian "Catskill" clastic wedge in the subsurface of western Pennsylvania: U.S. Department of Energy, Eastern Gas Shales Project, EGSP Series 13, 40 p., illus., **1979.** The 39 maps (scale 1:1,000,000) and text contain structural, isopach, and lithofacies data for the "Catskill" clastic wedge in Pennsylvania.

See also Craft, Jesse L., 7; Edmunds, William E., 10; Harper, John A., 2, 3, 4, 5, 6; Lytle, William S., 24, 27; Moser, Lynn, 1; Shumac, Karen, 1, 2.

PIRC, SIMON

1. Uranium and other elements in the Catskill Formation of east-central Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1979;** [abs.], Dissertation Abstracts International, v. 40, no. 4, p. 1586B, **1979.**

PITCAIRN, FEODOR, *see* Emrich, Grover H., 3.

PLATT, LUCIAN B.

1. (and Loring, R. B., Papaspyros, Athanasios, and Stephens, G. C.). The Hamburg klippe reconsidered: American Journal of Science, v. 272, no. 4, p. 305–318,

illus., **1972.** The Hamburg klippe is, rather than one large plate, a jumble of smaller pieces that arrived in the area of deposition of the Martinsburg Shale during the Middle Ordovician, apparently by gravity sliding.

See also Stephens, George C., 3; Wright, Thomas O., 8.

PODWYSOCKI, M. H.

1. The relationships of fracture traces to geologic parameters in flat-lying sedimentary rocks: a statistical analysis: University Park, Pennsylvania State University, Ph.D. thesis, **1974;** [abs.], Dissertation Abstracts International, v. 36, no. 1, p. 136B, **1975.**
2. (and Pohn, H., Merin, I. S., Krohn, D., Phillips, J. D., and Rowan, L. C.). Evidence for dual mechanisms of deformation in south-central New York and north-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 49, **1979.**

POHN, H. A.

1. (and Purdy, T. L.). Decollement in the southern Allegheny Plateau of Pennsylvania: U.S. Geological Survey Open-File Report 79–1321, 10 p., **1979** [not seen].
2. (and Purdy, T. L.). Thrust fault zones in the Allegheny Plateau of north-central Pennsylvania: U.S. Geological Survey Open-File Report 79–1604, 16 p., **1979** [not seen].

See also Podwysocki, M. H., 2.

POLLAK, HENRY L.

1. Some results of earth tide data analysis in the Pittsburgh, Pennsylvania area: University of Pittsburgh, Ph.D. thesis, **1971;** [abs.], Dissertation Abstracts International, v. 33, no. 4, p. 1623B, **1972.**

POMEROY, JOHN S.

1. Landslide susceptibility and land modified by man map of part of the Aliquippa 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–120, 17 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
2. Landslide susceptibility and land modified by man map of part of the Clinton 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–234, 16 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
3. Landslide susceptibility and land modified by man map of the Baden 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–121, 21 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
4. Landslide susceptibility map of part of the Mars 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–114, 18 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
5. Landslide susceptibility map of part of the Valencia 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–116, 18 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
6. Landslide susceptibility map of the Ambridge 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–76, 19 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
7. Landslide susceptibility map of the Emsworth 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–75, 15 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].

8. Landslide susceptibility map of the Glenshaw 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–118, 18 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
9. Landslide susceptibility map of the Oakdale 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–232, 16 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
10. Landslide susceptibility map of the Pittsburgh East 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–229, 16 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
11. Landslide susceptibility map of the Pittsburgh West 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–228, 16 p., illus., 1 pl., scale 1:24,000, **1974** [not seen].
12. Map of land modified by man in part of the Mars 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–115, 2 p., 1 pl., scale 1:24,000, **1974** [not seen].
13. Map of land modified by man in part of the Valencia 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–117, 2 p., 1 pl., scale 1:24,000, **1974** [not seen].
14. Map of land modified by man in the Ambridge 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–74, 3 p., 1 pl., scale 1:24,000, **1974** [not seen].
15. Map of land modified by man in the Emsworth 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–73, 2 p., 1 pl., scale 1:24,000, **1974** [not seen].
16. Map of land modified by man in the Glenshaw 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–119, 3 p., 1 pl., scale 1:24,000, **1974** [not seen].
17. Map of land modified by man in the Oakdale 7½-minute quadrangle, Allegheny County and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74–233, scale 1:24,000, **1974** [not seen].
18. Map of land modified by man in the Pittsburgh East 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–231, scale 1:24,000, **1974** [not seen].
19. Map of land modified by man in the Pittsburgh West 7½-minute quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–230, scale 1:24,000, **1974** [not seen].
20. Map showing density of landslides in the Pittsburgh East quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–236, 3 p., 1 pl., scale 1:24,000, **1974** [not seen].
21. Map showing density of landslides in the Pittsburgh West quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Open-File Report 74–235, 3 p., 1 pl., scale 1:24,000, **1974** [not seen].
22. (and Davies, W. E.). Landslides in the Pittsburgh area, Allegheny County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 107, **1975.**
23. (and Davies, W. E.). Map of susceptibility to landsliding, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF–685–B, scale 1:50,000, 2 sheets, **1975.** Past, presently active, and potential landslides are identified and described. Most are related to red shale and claystone in the Conemaugh Group and to nonred beds in the Monongahela Group.

24. Reconnaissance maps showing landslides in the Amity, Bridgeville, California, Canonsburg, Ellsworth, Hackett, Monongahela, and Washington East quadrangles, eastern Washington County, Pennsylvania: U.S. Geological Survey Open-File Report 76–790, 5 p., illus., 8 pls., scale 1:24,000, **1976** [not seen].
25. Reconnaissance maps showing landslides in the Avella, Burgettstown, Claysville, Clinton, Midway, Prosperity, West Middletown, and Washington West quadrangles, western Washington County, Pennsylvania: U.S. Geological Survey Open-File Report 76–789, 5 p., illus., 8 pls., scale 1:24,000, **1976** [not seen].
26. Geologic setting of landsliding in a 3-county area, western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 309–310, **1977.**
27. Landslide susceptibility map of the Pittsburgh West quadrangle, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–1035, scale 1:24,000, **1977.** Potential slope-stability problems significant to development are identified. The map is a guide to areas of past landslides and present susceptibility to landsliding.
28. Map showing landslides and slopes most susceptible to sliding in part of the Aliquippa 7½-minute quadrangle, Beaver County, Pennsylvania: U.S. Geological Survey Open-File Report 77–832, 7 p., 1 pl., scale 1:24,000, **1977** [not seen].
29. Maps showing landslides and slopes most susceptible to sliding in parts of the Mars and Valencia 7½-minute quadrangles, Butler County, Pennsylvania: U.S. Geological Survey Open-File Report 77–818, 7 p., 1 pl., scale 1:24,000, **1977** [not seen].
30. Preliminary reconnaissance map showing landslides in Beaver County, Pennsylvania: U.S. Geological Survey Open-File Report 77–245, 4 p., 1 pl., scale 1:50,000, **1977** [not seen].
31. Preliminary reconnaissance map showing landslides in Butler County, Pennsylvania: U.S. Geological Survey Open-File Report 77–246, 3 p., 2 pls., scale 1:50,000, **1977** [not seen].
32. Reconnaissance map showing landslides in Washington County, Pennsylvania: U.S. Geological Survey Open-File Report 77–307, 5 p., 2 pls., **1977** [not seen].
33. Isopleth map of landslide deposits, Washington County, Pennsylvania— a guide to comparative slope stability: U.S. Geological Survey Miscellaneous Field Studies Map MF–1010, scale 1:50,000, 2 sheets, **1978.** Areas of potential slope-stability problems are identified.
34. Map showing landslides and areas most susceptible to landsliding, Butler County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF–1024, scale 1:50,000, 2 sheets, **1978.** Areas of potential slope stability problems are identified.
35. Map showing landslides and areas most susceptible to sliding in Beaver quadrangle and portions of the Beaver Falls and New Galilee quadrangles, Beaver County, Pennsylvania: U.S. Geological Survey Open-File Report 78–387, 7 p., 3 pls., scale 1:24,000, **1978** [not seen].
36. Regional aspects of mass movement in the Appalachian Plateaus, western Pennsylvania [abs.]: Association of Engineering Geologists, Annual Meeting, Program and Abstracts, unpaginated, **1978.**
37. Slope stability in the Appalachian Plateaus, western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 80, **1978.**
38. Map showing landslides and areas most susceptible to sliding in Beaver County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–1160, scale 1:50,000, **1979.** More than 3,000 recent and older landslides are iden-

tified. Movement on slopes is related to specific rock sequences. Areas most prone to sliding occur in the southern part of the county.

39. Relict debris flows in northwestern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 497, **1979.**
40. Storm-induced landslides in the Johnstown area [Cambria County], Pennsylvania, July 19–20, 1977 [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 49, **1979.**
41. (and Davies, W. E.). Landslides and related features, Pennsylvania— Pittsburgh 1° x 2° sheet: U.S. Geological Survey Open-File Report 79–1314, scale 1:24,000, 128 sheets, **1979.** Maps show locations of active or recently active landslides; areas susceptible to landsliding, debris flows, or rockfall; areas least prone to landsliding; and man-made features such as strip mines, coal refuse banks, quarries, and gravel pits.

See also Briggs, Reginald P., 5; Davies, William E., 25, 26.

POPEK, J. P., *see* Sutter, J. F., 1.

POREBSKI, FRANCIS, *see* Karcz, Iaakov, 1, 2.

PORTER, W. M.

1. Structural and geophysical studies in the Delaware-Pennsylvania Piedmont: Newark, University of Delaware, M.S. thesis, **1976.**

POTH, CHARLES W.

1. Hydrology of the Martinsburg Formation in Lehigh and Northampton Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 30, 52 p., illus. including geologic map, **1972.** The Martinsburg Formation underlies the northern half of Lehigh and Northampton Counties, and is of Middle and Late Ordovician age. Median yields of domestic and nondomestic wells are greatest in the Pen Argyl Member. The formation as a whole has a specific capacity of about 0.5 gallon per minute per foot of drawdown.
2. Summary ground-water resources of Armstrong County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 34, 38 p., illus. including geologic map, **1973.** Groundwater occurs in unconsolidated deposits along the stream valleys and in fractures in the bedrock. Yields of wells in the unconsolidated deposits average about 400 gallons per minute, and yields of wells in bedrock average about 25 gallons per minute. The chief water problem is contamination by drainage from coal-mining operations; other sources of contamination are the hundreds of oil and gas wells that were abandoned and not properly plugged.
3. Summary ground-water resources of Beaver County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 39, 39 p., illus. including geologic map, **1973.** Groundwater occurs largely in the unconsolidated Quaternary alluvial deposits that are present as terraces and floodplains along the major streams. The discharge from abandoned strip and deep mines is a major source of pollution, as are the hundreds of oil and gas wells that were abandoned and not properly plugged.
4. Summary ground-water resources of Butler County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 36, 49 p., illus. including geologic map, **1973.** The Quaternary outwash deposits and some of the Quaternary lacustrine deposits are highly permeable and capable of yielding 100 or more gallons per minute to wells. High iron content is the main water-quality problem.

Average yields for the Conemaugh, Allegheny, and Pottsville Groups and the Burgoon Sandstone are 20, 50, 36, and 82 gallons per minute, respectively. The discharge from abandoned strip and deep mines is a major source of pollution, as are the hundreds of oil and gas wells that were abandoned and not properly plugged.

5. Summary ground-water resources of Lancaster County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 43, 80 p., illus. including geologic map, **1977.** The northern tenth of the county is underlain by sandstone and shale of the Gettysburg-Hammer Creek Formations, the New Oxford-Stockton Formations, and diabase; the median yields of wells in these three units are 16, 12, and 10 gallons per minute, respectively. The central half of the county is underlain by carbonate rocks and shale of Ordovician and Cambrian age which have an average specific capacity of about 2 gallons per minute per foot of drawdown. The southern part of the county is underlain by Precambrian to lower Paleozoic metamorphic rocks of the Peters Creek Schist and Wissahickon Formation, and wells in these units have a median yield of 10 gallons per minute.

POTTER, PAUL E., *see* Broadhead, R. F., 1; Pettijohn, F. J., 1.

PRESLEY, MARK W., *see* Donaldson, Alan C., 2.

PRESTON, FRANK W.

1. Drainage changes in the late Pleistocene in central western Pennsylvania: Pittsburgh, Pa., Carnegie Museum of Natural History, 56 p., illus., **1977.** The text contains descriptions of specific geographic features, the types of fossils that can be discovered, and areas that have remained unchanged. Features included are McConnells Mill State Park, Moraine State Park, and Lake Arthur.

PRICE, HELEN

1. (and Johnson, Arthur). Relationship between alluvial soils and flooding in the Piedmont Lowland of southeastern Pennsylvania: Water Resources Research, v. 14, no. 6, p. 1189–1194, illus., **1978.** The relationship between calculated flood recurrence intervals and alluvial soils is summarized for Bucks, Berks, and Montgomery Counties.

PRICE, JOHN W., *see* Derstler, Kraig L., 2.

PRICE, MICHAEL L.

1. The stratigraphy and environments of deposition of the Birmingham Shale (Upper Pennsylvanian) of the Pittsburgh area: University of Pittsburgh, M.S. thesis, **1970.**

PRICE, VAN

1. (and Ferguson, R. B., and Baucom, E. I.). Savannah River Laboratory, Hydrogeochemical and stream sediment reconnaissance—Raw data release III, Orientation study in the Williamsport, Pennsylvania, area: U.S. Energy Research and Development Administration Report DPST-76-141-3 (GJBX-53), 12 p., **1976** [not seen].

PROSSER, WILLIAM J., *see* Lovegreen, Jon R., 1.

PROUTY, C. E.

1. Classical Pennsylvanian—Allegheny and Conemaugh sequences, western Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and

Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 168, **1979.**

PRYOR, WAYNE A., *see* Lundegard, Paul D., 1.

PUFFER, JOHN H., *see* Haji-Vassiliou, Andreas, 1.

PUGLIO, DONALD G.

1. Geology of the Lower Kittanning coalbed in portions of Indiana, Westmoreland, and Armstrong Counties, Pennsylvania: University of Pittsburgh, M.S. thesis, **1977.**
2. Geology of the Kittanning coalbeds (Kittanning Formation) in portions of Indiana and Westmoreland Counties, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 80–81, **1978.**
3. (and Iannacchione, A. T.). Geology, mining, and methane content of the Freeport and Kittanning coalbeds in Indiana and surrounding counties, Pa.: U.S. Bureau of Mines Report of Investigations 8406, 35 p., illus., **1979.** The methane content of core samples from 25 mines shows that gas increases with depth. The results suggest that methane control problems will be encountered as deeper coals are mined.
4. (and Iannacchione, A. T.). Structural deformation of the Allegheny Group of coalbeds in the Appalachian Plateau of central Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 168–169, **1979.**

See also Iannacchione, Anthony T., 3.

PULLMAN SWINDELL

1. Irwin syncline basin mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 103-5, variously paginated, illus., **1977.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

PURDY, T. L., *see* Pohn, H. A., 1, 2.

PYRON, ARTHUR J.

1. Contact metamorphism in south-eastern Pennsylvania [abs.]: Pennsylvania Academy of Science Proceedings, v. 51, no. 1, p. 96, **1977.**

QUAAH, A. O.

1. Gravity and magnetic studies of the Everett and Mason-Dixon lineaments in southcentral Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1977.**

QUANT, BETSY

1. An analysis of agricultural potential of five soils in the Buffalo Valley of central Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

QUEHL, ALBERT R., JR.

1. *Delocrinus* speciation during the Late Pennsylvanian in western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 109, **1975.**

RACKOFF, JEROME S.

1. The osteology of Sterropterygion (Crossopterygii; Osteolepidae) and the origin of tetrapod locomotion: New Haven, Conn., Yale University, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 37, no. 12, pt. 1, p. 6034B, **1977.**

See also Thomson, Keith S., 3.

RADNER, L., *see* Buck, R. J., 1.

RAGLAND, PAUL C., *see* Wiegand, Peter W., 1.

RAHMANIAN, VICTOR D. K.

1. Stratigraphy and sedimentology of the Upper Devonian Catskill and uppermost Trimmers Rock Formations in central Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1979.**
2. (and Williams, E. G.). Tide-dominated deltaic-intradeltaic sedimentation, Upper Devonian, central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 50, **1979.**

RAHN, PERRY H., *see* Johnson, Arvid M., 1.

RAIT, N., *see* Medlin, J. H., 1.

RALPH, E. K.

1. (and Michael, H. N.). MASCA radiocarbon dates for sequoia and bristlecone-pine samples, *in* Radiocarbon variations and absolute chronology: Nobel Symposium, 12th, Uppsala University, Uppsala, Sweden, 1969, Proceedings, New York, Wiley Interscience Division, p. 619–623, **1970** [not seen].

RAMAN, SWAMINATHAN V.

1. A crystallization model for the rare earth element distributions in Honey Brook anorthosite, Pa. [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 18, p. 417–418, **1979.**
2. Petrology and geochemistry of anorthosite and associated rocks, Honey Brook [Chester County], Pennsylvania: New Brunswick, N. J., Rutgers University, Ph.D. thesis, **1979.**

RAMANI, R. V.

1. Integration of land use planning with surface mining: Earth and Mineral Sciences, v. 47, no. 5, p. 33, 37–39, illus., **1978.** Reclamation of lands after the removal of resources must be an integral part of planning if surface mining is to be compatible with environmental issues.

RANKIN, DOUGLAS W.

1. Opening of the Iapetus Ocean: Appalachian salients and recesses as Precambrian triple junctions [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 7, p. 1238, **1975.**
2. Appalachian salients and recesses: Late Precambrian continental breakup and the opening of the Iapetus Ocean: Journal of Geophysical Research, v. 81, no. 32, p. 5605–5619, illus., **1976.** Appalachian salients and recesses are inherited from the initial breakup of a continental mass by the intersection of rift valleys radiating from triple junctions. South Mountain, Pennsylvania, is one of the salients discussed.

RANKIN, WILLIAM E.

1. (and Lavin, P. M.). Analysis of a reconnaissance gravity survey for drift-filled valleys in the Mercer quadrangle, Pennsylvania: Journal of Hydrology, v. 10,

no. 4, p. 418–435, illus., **1970.** The effectiveness of a standard polynomial trend removal technique and two-dimensional wave-number filtering was evaluated for an area in northwestern Pennsylvania. The two-dimensional-filtering method resulted in the the most complete information and avoided many of the problems of the polynomial method.

RANNEY, RICHARD W.

1. (and Ciolkosz, E. J., Petersen, G. W., Matelski, R. P., Johnson, L. J., and Cunningham, R. L.). The pH base-saturation relationship in B and C horizons of Pennsylvania soils: Soil Science, v. 118, no. 4, p. 247–253, illus., **1974.** Data from 555 soil profiles were used to determine the factors affecting the pH base-saturation relationship, and attempts were made to improve predictions of base-saturation percentage from pH.
2. (and Ciolkosz, E. J., Cunningham, R. L., Petersen, G. W., and Matelski, R. P.). Fragipans in Pennsylvania soils: properties of bleached prism face materials: Soil Science Society of America Proceedings, v. 39, no. 4, p. 695–698, **1975.** Bleached prism faces in fragipans are accumulations of bimodally distributed particles derived from higher horizons and emplaced by deposition and stripping in desiccation cracks.

See also Petersen, Gary W., 1.

RARING, ANDREW M.

1. (and Ganis, Robert). An occurrence of conodont-bearing allochthonous carbonates in the Martinsburg Formation, Berks County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 210, **1973.**

RASMUSSEN, ROBERT

1. A study of ground water in Union County, Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1972.**

RATZLAFF, JOHN R.

1. Temporal resolution in spectral analysis of hydrologic time series [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 210–211, **1973.**

RAUCH, HENRY W.

1. (and White, W. B.). Lithologic controls on the development of solution porosity in carbonate aquifers: Water Resources Research, v. 6, no. 4, p. 1175–1192, illus., **1970.** The object of this study was to determine the lithologic controls on the distribution of conduits within a heterogeneous sequence of carbonate rocks. The volume of all accessible caves more than 100 feet in length in the Nittany Valley area of central Pennsylvania was measured.
2. (and White, W. B.). Solution kinetics of Middle Ordovician carbonate rocks from central Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 51, no. 4, p. 285, **1970.**
3. (and White, W. B.). Lithologic controls on permeability, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 21–27, illus., **1971;** Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 21–27, illus., **1971.** Based on a permeability study of the Nittany Valley carbonates, it was concluded that cavernous development is more favorable in limestones containing higher percentages of fine-grained micrite and lower percentages of magnesium, alumina, silica, and sparite.

4. The effects of lithology and other hydrogeologic factors on the development of solution porosity in the Middle Ordovician carbonates of central Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1972**; [abs.], Dissertation Abstracts International, v. 34, no. 3, p. 1154B, **1973.**
5. The effects of silty streaks and bedding partings on cave development in central Pennsylvania, *in* Rauch, H. W., and Werner, Eberhard, eds., Proceedings of the Fourth Conference on Karst Geology and Hydrology [Morgantown, W. Va., 1974]: West Virginia Geological and Economic Survey, p. 153–160, illus., **1974.** Hydrogeologic properties of carbonate aquifers, including caves, are a function of carbonate lithology. The presence of silty streaks is one of the most important lithologic properties affecting cavity development in carbonate rocks.
6. (and White, W. B.). Dissolution kinetics of carbonate rocks; 1, Effects of lithology on dissolution rate: Water Resources Research, v. 13, no. 2, p. 381–394, illus., **1977.** Laboratory dissolution of Middle Ordovician rock samples from central Pennsylvania was studied. The results show that carbonate lithology exerts a strong influence on the dissolution rate and hence on the degree of cavity development in karst aquifers.

RAY, CLAYTON E.

1. (and Denny, C. S., and Rubin, Meyer). A peccary, *Platygonus compressus* LeConte, from drift of Wisconsinan age in northern Pennsylvania: American Journal of Science, v. 268, no. 1, p. 78–94, illus., **1970.** A skeleton of the peccary *Platygonus compressus* LeConte was recovered from a borrow pit at Mosherville, Bradford County.

RAYMOND, ROBERT, JR.

1. Correlating organic sulfur in coal to depositional environments by electron probe microanalysis [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 175, **1979.**
2. (and Davies, T. D.). Content and form of sulfur in coal: a reflection of peat depositional environments [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 501, **1979.**

READLING, CHARLES L., *see* Crump, Lulie H., 1.

REBER, EARL J.

1. Soil survey of Susquehanna County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 89 p., illus. including soils maps, **1973.** Includes detailed descriptions and maps of the soils, as well as sections on use and management, and formation and classification of the soils.

RECTOR, DEAN, *see* Yaworski, Michael, 1.

REDDING, ERIC J.

1. Mercer Pike Run: highway construction, increased sediment load, stream morphologic changes, recent sediment pollution laws: Meadville, Pa., Allegheny College, Bachelor's thesis, **1972.**

REED, JULIET C.

1. Annotated bibliography of minerals new to the Pennsylvania list, 1965–1974: Mineralogical Society of Pennsylvania, 83 p., **1976.** Fifty-five species are listed alphabetically, and locality, host rock, and literature references are cited.

REED, LLOYD A.

1. Hydrology and sedimentation of Corey Creek and Elk Run basins, north-central Pennsylvania: U.S. Geological Survey Water-Supply Paper 1532-E, p. E1-E27, illus., **1971.** An analysis of data collected from two small agricultural basins during the period of May 1954 to September 1967 indicates that conservation measures reduced the quantity of suspended sediment leaving the Corey Creek basin as a result of frequent storms during the growing season. The Elk Run basin was not subjected to extensive soil conservation treatment; it was used for external control to assist in detecting and evaluating the hydrologic changes in the Corey Creek basin.
2. Hydrology and sedimentation of Bixler Run basin, central Pennsylvania: U.S. Geological Survey Open-File Report 75-26, 36 p., illus., **1975;** U.S. Geological Survey Water-Supply Paper 1798-N, p. N1-N20, illus., **1976.** Rainfall, streamflow, stream chemical, and sediment-discharge data were collected as part of a study to evaluate sediment discharge from an agricultural area in which soil-conservation techniques were being adopted at a moderate rate.
3. Sediment characteristics of five streams near Harrisburg, Pennsylvania, before highway construction: U.S. Geological Survey Water-Supply Paper 1798-M, p. M1-M29, illus., **1976.** Rainfall, streamflow, sediment, and turbidity data were collected to evaluate the effects of highway construction on sediment discharge, and to determine the effectiveness of different erosion-control measures in reducing sediment discharge.
4. Sediment control during highway construction in Pennsylvania, *in* Environmental aspects of irrigation and drainage: New York, American Society of Civil Engineers, p. 497-507, illus., **1976** [not seen].
5. Effectiveness of sediment-control techniques used during highway construction in central Pennsylvania: U.S. Geological Survey Open-File Report 77-498, 134 p., illus., **1977;** U.S. Geological Survey Water-Supply Paper 2054, 57 p., illus., **1978.** Of the methods reviewed, the most effective for sediment control was the building of offstream ponds to intercept the runoff from the construction area before it reached the stream.

See also Truhlar, John F., 1; Williams, Kenneth F., 1; Yorke, Thomas H., 1.

REHM, BERNARD

1. The areal extent of coarse sediment on the bed of Woodcock Creek: Meadville, Pa., Allegheny College, Bachelor's thesis, **1974.**

REHMER, JUDITH

1. Stratigraphy and depositional environment of the Esopus Shale, eastern New York and adjacent states [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 311-312, **1977.**

REICH, BRIAN M.

1. Land surface form in flood hydrology: [abs.], Environmental Geology Symposium, 1st, Binghamton, State University of New York, Department of Geology, Program, p. 6, **1970;** *in* Coates, D. R., ed., Environmental geomorphology [Annual Geomorphology Symposia Series, 1st, Binghamton, N. Y., 1970, Proceedings]: Binghamton, State University of New York, p. 49-68, illus., **1971.** A preliminary investigation was conducted to stratify flood statistics from 102 Pennsylvania and neighboring watersheds in three different physiographic provinces. Found to be most promising is the 2.33-year peak in cubic feet per second adjusted to a 10-mile-square watershed. Hammond's Land Surface Classes are considered, and the no-

tion that various hydrologic regions have correspondingly different frequency curves is clearly disproved.

2. Seasonal occurrence of annual floods on small Pennsylvania watersheds: Water Resources Bulletin, v. 7, no. 6, p. 1153–1171, illus., **1971.** Maximum annual discharges from 66 watersheds were measured.

See also Heerdegen, Richard G., 1; White, Elizabeth L., 1, 2.

REICH, J. R., JR.

1. (compiler). Caves of southeastern Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 65, 120 p., illus., **1974.** This is the first volume in a series on caves throughout Pennsylvania. More than 80 caves in Adams, Bucks, Chester, Delaware, Lancaster, Montgomery, Philadelphia, and York Counties are listed. For each cave, the location and a summary of the history, geology, and other characteristics are given. Plans and cross-sectional map views are included for most caves.
2. Big Pit Cave and Crystal Paradise Cave [Dauphin County], *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 76–78, illus., **1978.** Short descriptions and maps of each cave are provided.

REIDENOUER, DAVID R.

1. (and Geiger, E. G., Jr., and Howe, R. H.). Suitability of shale as a construction material, *in* Best, C. H., chairman, Living with marginal aggregates: Symposium, Montreal, Canada, 1975, American Society for Testing and Materials Special Technical Publication 597, p. 59–75, illus., **1976.** A procedure for testing suitability of shale as an aggregate is discussed. Includes test results of 224 specimens from Pennsylvania.
2. (and Williams, E. G., and Dutcher, R. R.). The relationship between paleotopography and sulfur distribution in some coals of western Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 88–101, illus., **1979** [reprinted from Economic Geology, v. 62, no. 5, p. 632–647, 1967].

REIF, CHARLES B.

1. (and Rodda, Nancy). Chemical profile of Nuangola Bog: Pennsylvania Academy of Science Proceedings, v. 48, p. 28–29, **1974.** Includes trace-element data for metals in uncombined water from surface to 11-m depth.

REINHARDT, JUERGEN, *see* Gohn, Gregory S., 5.

REISINGER, H. JAMES

1. Release of heavy metals from contaminated river sediments: Pennsylvania Academy of Science Proceedings, v. 52, no. 2, p. 183–185, illus., **1978.** Concentrations of cadmium, chromium, copper, lead, and zinc were investigated in sediments of the Schuylkill River at Pottstown, a stretch scheduled for channel modification. Results showed that disruption of the sediments might release metals in quantities sufficient to harm the indigenous biological community.

REMSON, IRWIN

1. Hydrologic and disposal problems in urban areas, *in* Nichols, D. R., and Campbell, C. C., eds., Environmental planning and geology [Symposium on Engineering Geology in the Urban Environment, 1969, San Francisco, Proceedings]:

Washington, D. C., U.S. Geological Survey (U.S. Department of the Interior) and Office of Research and Technology (U.S. Department of Housing and Urban Development), p. 36–41, illus., **1971.** A preliminary hydrologic analysis and design for the watershed of the Upper East Branch of Brandywine Creek, Chester County, is one of the topics discussed.

RENDON-HERRERO, OSWALD

1. Unit sediment graph: Water Resources Research, v. 14, no. 5, p. 889–901, illus., **1978.** The unit hydrograph method was extended to sediment graph analyses, thus yielding a unit sediment graph. The method is applicable to small watersheds where the main contributor to suspended sediment is upland erosion. The watershed used as a data source is Bixler Run, Perry County.

RENKEN, ROBERT A.

1. (and Bleiweiss, Peter). The geology of the Stony Hill-Oak Hill region [Lancaster County]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

RENTON, JOHN J., *see* Cecil, C. Blaine, 1; Donaldson, Alan C., 2, 3, 4; Streib, Donald L., 1, 2, 3.

REPETSKI, JOHN E.

1. Paleontological studies of the Ordovician in Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 50, **1979.**

REUTER, J. HELMUT

1. Organic geochemical studies on waters and sediments from the Delaware estuary [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 680–681, **1971.**

REVELL, STEPHEN

1. (and Schrock, Ronald). Geology of the Turkey Hill-Highville area [Lancaster County]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1972.**

REVETTA, FRANK A.

1. A regional gravity survey of New York and eastern Pennsylvania: Rochester, N. Y., University of Rochester, Ph.D. thesis, **1970**; [abs.], Dissertation Abstracts International, v. 31, no. 7, p. 4142B, **1971.**

See also Muller, Otto H., 1.

REXROAD, CARL B., *see* Horowitz, Alan S., 1.

REYES-NAVARRO, JAIME

1. Pyrite in coal—its forms and distribution as related to the environments of coal deposition in three selected coals from western Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1976.**
2. (and Davis, A.). Pyrite in coal: its forms and distribution as related to the environments of coal deposition in three selected coals from western Pennsylvania: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report SR-110, 141 p., illus., **1976.** The relationship between the amount of pyrite in coal and the depositional environment of the coal was examined. Pyrite deposition was shown to be favored by a marine-brackish environment, even though some forms of pyrite were found to be more prevalent in coals developed in freshwater environments.

RHINDRESS, RICHARD C.

1. Gasoline pollution of a karst aquifer, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 171–175, illus., 1971; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 171–175, illus., 1971. A gasoline spill in the Rockdale Run Formation near Mechanicsburg, Cumberland County, is discussed.
2. Gasoline pollution of an unconfined karst aquifer—A case history [abs.]: Geological Society of America Abstracts with Programs, v. 3, no. 7, p. 681, 1971.

RICHARDS, JAMES W.

1. Discussion: geologic problems of urban growth in limestone terrains of Pennsylvania: Association of Engineering Geologists Bulletin, v. 8, no. 2, p. 195–200, illus., 1971. Geophysical methods, particularly electrical resistivity, aid investigations by locating solution channels, clay pockets, and pinnacle weathering, thus improving foundation exploration techniques.
2. A series of computer programs to facilitate the use of electrical resistivity techniques [abs.]: Association of Engineering Geologists Annual Meeting, 15th, Program and Abstracts, p. 33–34, 1972.

See also Branthoover, Gerald L., 4; Camlin, B. M., 1.

RICHARDS, ROBERT, *see* Wilson, Larry, 1.

RICHARDSON, A. M.

1. Landslide in claystone derived soil: American Society of Civil Engineers, Proceedings, Journal of the Geotechnical Engineering Division, v. 105, no. GT7, p. 857–869, illus., 1979. A landslide, which occurred in a soil deposit derived from claystone of the Pittsburgh Red Beds when a cut was made at the toe, is described.

RICKARD, LAWRENCE V.

1. Gamma-ray logs and the origin of salt, *in* Rau, J. L., and Dellwig, L. F., eds., Third Symposium on Salt: Cleveland, Ohio, Northern Ohio Geological Society, v. 1, p. 34–39, illus., 1970. Regional correlations are made between Michigan, New York, and Pennsylvania using gamma-ray logs. A hypothesis is developed for the origin of Appalachian salt beds in which subsidence occurs before salt deposition.
2. Stratigraphy and structure of the subsurface Cambrian and Ordovician carbonates of New York: New York State Museum and Science Service Map and Chart Series 18, 26 p., illus., 19 pls., 1973. Maps and cross sections show the thickness, structure, and stratigraphic relationships of the carbonates. Correlations with surface exposures are established. Subsurface Cambrian and Ordovician carbonates in northern Pennsylvania are included.

See also Edmunds, William E., 10.

RICKERT, DAVID A., *see* Lystrom, David J., 2, 3.

RIDGE, JOHN D.

1. Pennsylvania, *in* Ridge, J. D., Annotated bibliographies of mineral deposits in the Western Hemisphere: Geological Society of America Memoir 131, p. 487–491, 1972. The Cornwall mines, Lebanon County, and Lancaster Gap mine, Lancaster County, are included.

2. (and DeYoung, J. H., Jr.). Historical statistics of Pennsylvania's mineral industries, 1966–1970: Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Bulletin 87, 76 p., illus., **1972.** A supplement to the series that provides a continuous statistical record of Pennsylvania's mineral industries.

A. B. RIEDEL ASSOCIATES, *see* Berger Associates, 2.

RIFKEN, M., *see* Buck, R. J., 1.

RIGOTTI, PETER A., *see* Baier, E., 1.

RINELLA, FRANK A., *see* Lystrom, David J., 1, 2, 3.

RITTER, DALE F.

1. (and Kinsey, W. F., III, and Kauffman, M. E.). Overbank sedimentation in the Delaware River valley during the last 6000 years: Science, v. 179, no. 4071, p. 374–375, **1973.** A thick sequence of floodplain sediments has accumulated in the Delaware River valley by the process of overbank deposition. Fourteen radiocarbon dates showed that deposition began at least 6,000 years ago and has continued to the present. Because the river shifts its position laterally at a very slow rate, overbank deposition becomes dominant in the construction of its floodplain.

RITTER, JOHN R.

1. The effects of the Hurricane Agnes flood on channel geometry and sediment discharge of selected streams in the Susquehanna River basin, Pennsylvania: Journal of Research of the U.S. Geological Survey, v. 2, no. 6, p. 753–761, illus., **1974.** The possible effects of the flooding on sediment erosion and deposition in stream channels were analyzed.

ROBELEN, PETER G., *see* Crawford, William A., 1.

ROBERTS, FRANK H.

1. Ultramafic rocks along the Precambrian axis of southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Ph.D. thesis, **1969.**
2. (and Crawford, W. A.). Metamorphism of ultramafic rocks of southeastern Pennsylvania, *in* Amenta, R. V., and others, Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, p. 14–19, illus., **1974.** Occurrences of ultramafic rocks in the field trip area are discussed. The petrography and chemistry of the various rock types in each ultramafic body are presented in tabular form.

See also Amenta, Roddy V., 4.

ROBERTS, J. M., SR.

1. (and Johnson, L. J.). Soil clay mineral quantification by the internal standard X-ray diffraction method [abs.]: Clay Minerals Conference, 23rd, Program and Abstracts, p. 53, **1974.**

ROBERTS, KEITH C., *see* Shackleton, R. D., 1.

ROBERTS, MICHAEL A., JR.

1. Structure of Summit dome, Chestnut Ridge, Pennsylvania: Columbia, University of South Carolina, M.S. thesis, **1973.**

ROBINSON, J., *see* Todd, S. J., 1.

ROBINSON, M. J., *see* Ferm, John C., 7.

RODDA, NANCY, *see* Reif, Charles B., 1.

RODGERS, JOHN

1. The tectonics of the Appalachians: New York, Wiley-Interscience, 271 p., illus., **1970.** The book provides a synthesis of the structural geology and history of this complex chain. The author views each of the geological provinces in the light of the others and develops a historical perspective of the growth of the mountain chain.

ROEN, JOHN B.

1. Geologic map of the Waynesburg quadrangle, southwestern Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ–838, scale 1:24,000, **1970.** Pennsylvanian and Permian rocks and Quaternary deposits were mapped. Structure contours were drawn on the base of the Pittsburgh coal bed, which underlies the entire quadrangle. Mineral resources consist of coal, oil, natural gas, limestone, sandstone, clay, and shale.
2. Sandstone distribution in lower member of Waynesburg Formation, Greene and Washington Counties, southwest Pennsylvania: discussion: American Association of Petroleum Geologists Bulletin, v. 54, no. 3, p. 532–534, illus., **1970.**
3. Preliminary geologic map of the Midway quadrangle, Washington County, southwestern Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF–319, scale 1:24,000, 2 sheets, **1971** [not seen].
4. A small-scale thrust fault associated with low-amplitude flexural-slip folding, Greene County, southwest Pennsylvania, *in* Geological Survey research 1972, Chapter D: U.S. Geological Survey Professional Paper 800–D, p. D25–D27, illus., **1972.** A small fault was exposed in a railroad cut near Waynesburg. The fault is a thrust that strikes parallel to the regional folds and dips toward a synclinal axis.
5. Geologic map of the Oak Forest quadrangle and part of the Blacksville quadrangle, southwestern Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–699, scale 1:24,000, **1972.** Pennsylvanian and Permian rocks and Quaternary deposits were mapped. Structure contours were drawn at the base of the Pittsburgh coal bed. Mineral resources include coal, natural gas, oil, sandstone, clay, and shale.
6. Geologic map of the Midway quadrangle, Washington County, southwestern Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ–1067, scale 1:24,000, **1973.** Pennsylvanian and Permian rocks and Quaternary deposits were mapped. Coal is the most important resource; the Pittsburgh, Waynesburg, Waynesburg "A," and Washington are the principal coal beds. Other resources include oil, gas, sandstone, limestone, clay, and shale.
7. (and Kreimeyer, D. F.). Preliminary map showing the distribution and thickness of sandstone in the lower member of the Pittsburgh Formation, southwestern Pennsylvania and northern West Virginia: U.S. Geological Survey Miscellaneous Field Studies Map MF–529, scale 1:250,000, **1973.** This isopach map of the sandstone overlying the Pittsburgh coal bed is part of a broad geologic study of the area. It is intended primarily for coal-mine roof-stability research and for locating construction materials and groundwater.
8. (and Wallace, L. G., and de Witt, Wallace, Jr.). Preliminary stratigraphic cross section showing radioactive black shale zones in the Devonian black shales in eastern Ohio and west-central Pennsylvania: U.S. Geological Survey Open-File Report 77–840, 1 sheet, **1977** [not seen].

9. (and Wallace, L. G., and de Witt, Wallace, Jr.). Preliminary stratigraphic cross section showing radioactive zones in the Devonian black shales in the central part of the Appalachian basin: U.S. Geological Survey Oil and Gas Investigations Chart OC-87, 2 sheets, **1978.** This chart, which is one of a series, provides a preliminary regional stratigraphic framework and provisional nomenclature to be used as a basis for future mapping and geologic analyses of the Devonian black shales.
10. (and Wallace, L. G., and de Witt, Wallace, Jr.). Preliminary stratigraphic cross section showing radioactive zones of the Devonian black shales in eastern Ohio and west-central Pennsylvania: U.S. Geological Survey Oil and Gas Investigations Chart OC-82, 1 sheet, **1978.** See annotation in entry 9 above.

See also de Witt, Wallace, Jr., 7, 9; Schweinfurth, Stanley P., 1; Wallace, Laure G., 2.

ROFF, PETER A.

1. The seasonal periodicity and microdistribution of the Deatons flora of a riffle in Linesville Creek [Crawford County]: University of Pittsburgh, Ph.D. thesis, **1969;** [abs.], Dissertation Abstracts International, v. 30, no. 11B, p. 5105, **1970.**

ROGERS, WILBUR F.

1. Factors determining flood hydrographs in Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1970.**

ROGERS, WILLIAM F.

1. Hydrograph analysis and some related geomorphic variables: Geomorphology Symposia Series 2, Binghamton, State University of New York, p. 246–257, illus., **1975** [not seen].

ROGERSON, P. N.

1. The Doughty mine, Sunbury, Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1976.**

ROGOWSKI, ANDREW S.

1. Variability of the soil water flow parameters and their effect on the computation of rainfall excess and runoff, *in* International Symposium on Uncertainties in Hydrologic and Water Resource Systems, Proceedings, Vol. 1; Uncertainties in deterministic models: Tuscon, Ariz., Arizona University, Arizona Department of Hydrology and Water Resources, p. 359–377, illus., **1973** [not seen].

See also Heald, Walter R., 1; Pedersen, T. A., 1, 2.

ROLKE, C., *see* Sumner, John R., 1.

ROLLINS, HAROLD B.

1. (field trip coordinator). National Association of Geology Teachers, Eastern Section, Annual Spring Field Trips, April 14, 1973: National Association of Geology Teachers, Eastern Section, Annual Spring field trip, Pittsburgh, Pa., University of Pittsburgh, Guidebook, variously paginated, illus., **1973.** Two separate geologic field trips are included. The first trip features the geology of the Mississippian Loyalhanna and Mauch Chunk Formations exposed in the Laurel Caverns area on top of Chestnut Ridge in Fayette County. In the second trip, potential landslide hazards encountered in the construction of Interstate Routes 79 and 279 west of Pittsburgh are examined.
2. (and Donahue, Jack). Towards a theoretical basis of paleoecology: concepts of community dynamics: Lethaia, v. 8, no. 4, p. 255–270, illus., **1975.** Examples

from the Upper Pennsylvanian of the Appalachian basin were used in theorizing a conceptual framework for paleoecology.

See also Cain, Bruce, 2; Donahue, Jack, 1, 3, 4, 10, 11; Morris, Robert W., 1; Payne, Michael A., 1; Shaak, Graig D., 2.

ROMEO, M. K., *see* Frohne, K.-H., 1.

ROOT, SAMUEL I.

1. Disconformity exposed: Pennsylvania Geology, v. 1, no. 8, p. 3, 9, illus., **1970.** Vertical beds of sedimentary rocks are exposed in a roadcut at the Swatara Gap. Dark shales and siltstones of the Ordovician Martinsburg Formation and light-colored quartzites and conglomerates of the Silurian Tuscarora Formation are in contact.
2. Structure of the northern terminus of the Blue Ridge in Pennsylvania: Geological Society of America Bulletin, v. 81, no. 3, p. 815–830, illus., **1970.** South Mountain is an anticlinorium involving rocks that range in age from Precambrian to Ordovician. Regional stratigraphy, folding, faulting, and chronology of deformation are discussed.
3. Geology and hydrology of the Harrisburg West area, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 1–7, illus., **1971**; Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 1–7, illus., **1971.** A cursory description of the stratigraphy, structure, and hydrology of the area. Correlations with the Lebanon Valley sequence and geology of the State College area are included.
4. Geology and mineral resources of northeastern Franklin County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 119ab, 104 p., illus. including geologic map, **1971.** The geology of the area is described in detail. Exposed rocks are Cambrian to Ordovician in age and have been folded and faulted. Limestone, dolomite, shale, and sand and gravel are the important mineral resources.
5. Limestone chemistry and acid insoluble residues: Pennsylvania Geology, v. 4, no. 3, p. 13–15, illus., **1973.** From studies in Franklin and Cumberland Counties, it was thought that, in addition to measuring the total noncarbonate component of limestone, a study of the acid-insoluble residue fraction of the rock will give an approximation of the chemical composition.
6. Sequence of faulting, southern Great Valley of Pennsylvania: American Journal of Science, v. 273, no. 2, p. 97–112, illus., **1973.** Three distinct types of faults, some tens of kilometers long and with thousands of meters of displacement, were generated at slightly different times during the Alleghanian deformation of the Cambro-Ordovician rocks of the Cumberland Valley. The study focuses on the eastern part of the valley because the combination of fault relations there is unusual for the Appalachians.
7. Structure, basin development, and tectogenesis in the Pennsylvania portion of the folded Appalachians, *in* De Jong, K. A., and Scholten, Robert, eds., Gravity and tectonics: New York, John Wiley and Sons, p. 343–360, illus., **1973.** Central and western Pennsylvania are considered as a continuously subsiding basin during the Paleozoic. Deformation by folding above décollement surfaces occurred at the end of the Paleozoic. Movement of the detached block was to the northwest or up the slope of the basement.
8. Engineering problems in areas of limestone springs: Pennsylvania Geology, v. 7, no. 2, p. 6–9, illus., **1976.** The presence of springs in limestone rocks in the

Cumberland Valley indicates that fissures and caverns are also present. Construction in such areas should be preceded by core drilling or other subsurface investigations.

9. Geology and mineral resources of the Harrisburg West area, Cumberland and York Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 148ab, 106 p., illus. including geologic map, **1977.** The Late Cambrian to Late Ordovician age rocks of this part of the Cumberland Valley are mapped in detail. The stratigraphy, structure, economic potential, environmental and engineering properties, and hydrologic character of the rocks are discussed.
10. (and Hoskins, D. M.). Lat 40°N fault zone, Pennsylvania: a new interpretation: Geology, v. 5, no. 12, p. 719–723, illus., **1977.** A fault in the continental plate near latitude 40°N was inferred from a series of extensive east-west faults mapped in southern Pennsylvania. This structure, named the Transylvania fault, may relate to the previously proposed Kelvin fault on the oceanic plate.
11. (and Hoskins, Donald). Major cross structures in Pennsylvania (Part I): Pennsylvania Geology, v. 8, no. 2, p. 8–11, illus., **1977.** Recent geologic mapping confirmed an unusual fault a few miles north of N40° latitude near South Mountain, Cumberland County.
12. (and Hoskins, D. M.). Major east-west basement fault, north 40° latitude, southcentral Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 313, **1977.**
13. (and Wilshusen, J. P.). Structure and engineering geology at the Rockville cut: Pennsylvania Geology, v. 8, no. 1, p. 2–6, illus., **1977.** During highway construction north of Harrisburg a large excavation was made through Devonian Montebello quartzitic sandstones. This cut is interesting because of geologic structure visible on the surface and the engineering geology of the rocks.
14. Geology and mineral resources of the Carlisle and Mechanicsburg quadrangles, Cumberland County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 138ab, 1 sheet containing text and map, scale 1:24,000, **1978.** Cambro-Ordovician sedimentary rocks of the Cumberland Valley sequence underlie most of the area except for the southeast corner, which is underlain by rocks of the Triassic basin and Cambro-Ordovician rocks of the Lebanon Valley sequence. Mineral resources include coarse aggregate stone, sand and gravel, building stone, agricultural limestone and dolomite, and shales and clay.
15. (and MacLachlan, D. B.). Western limit of Taconic allochthons in Pennsylvania: Geological Society of America Bulletin, v. 89, no. 10, p. 1515–1528, illus., **1978.** Many of the rock types included in the Martinsburg are allochthonous; the western limit of allochthons is near Carlisle. The amount and variety of allochthonous rocks progressively increase eastward. The tectonic events that are thought to account for the distribution of allochthons in the Great Valley are discussed.
16. (compiler). Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey, 4th ser., Information Circular 84, 202 p., **1979.** Seven papers are reproduced with the expectation that the geologic information and its application will be of use to the coal industry. The papers deal directly with major aspects of those geologic factors that affect bituminous mining in Pennsylvania.

See also Hoskins, Donald M., 10; Lapham, Davis M., 11; MacLachlan, David B., 3.

ROSALSKY, MAURICE B.

1. The geomorphology of northern New Jersey and part of eastern Pennsylvania, A field trip guide, *in* Averill, S. P., ed., Field Trip Guide Book, Eastern Section, National Association of Geology Teachers: National Association of Geology Teachers, Eastern Section, Rutherford, N. J., Fairleigh Dickinson University,

1972, p. 2-1—2-7, illus., **1972.** The geomorphology of the Valley and Ridge province in eastern Pennsylvania is discussed, especially the formation of wind and water gaps. A stop on Godfrey Ridge to collect Devonian fossils is included, along with a stop at a Martinsburg slate quarry.

ROSE, ARTHUR W.

1. Atlas of Pennsylvania's mineral resources—Part 3, Metal mines and occurrences in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 50, Pt. 3, 14 p., illus., **1970.** A compilation of all known occurrences of arsenic, antimony, bismuth, chromium, cobalt, copper, gold, lead, molybdenum, nickel, silver, tungsten, uranium, and zinc, plus some data for iron, vanadium, cadmium, and barium. The location (plotted on a map), type of deposit, production class, and literature references are given for each occurrence.
2. (and Dahlberg, E. C., and Keith, M. L.). A multiple regression technique for adjusting background values in stream sediment geochemistry: Economic Geology, v. 65, no. 2, p. 156–165, illus., **1970.** A study of 3,000 samples in a 7,500-square-mile area of southeastern Pennsylvania indicated that drainage-basin lithology, relief, and iron and manganese content are significant variables that can be successfully used in a regression equation to improve the resolution of stream-sediment interpretation.
3. Trace metals in stream sediment of southeastern Pennsylvania—Part 2: Studies of anomalies from Part 1: Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Bulletin 86, 14 p., illus., **1971.** Trace elements listed in Part 1 were examined further, and additional sampling and field checking of some anomalies are reported.
4. Trace metals in stream sediment of southeastern Pennsylvania—Part 4: The Allentown-Bethlehem region and the Pennsylvania-Maryland border region: Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Bulletin 86, 27 p., illus., **1971.** One hundred eighty-two samples in the Allentown-Bethlehem area and 24 samples in the vicinity of the State Line ultramafic body were analyzed for trace metals by atomic absorption techniques. The distribution of the trace metals is discussed and shown on maps.
5. (and Keith, M. L.). Trace metals in stream sediment of southeastern Pennsylvania—Part 3: Multiple regression analysis of trace metal data: Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Bulletin 86, 36 p., illus., **1971.** A multiple regression of iron and manganese content, drainage basin lithology, and topographic relief was used to correct the background values of these variables in trace metals in stream sediments.
6. (and Suhr, N. H.). Major element content as a means of allowing for background variation in stream-sediment geochemical exploration, *in* Boyle, R. W., and McGerrigle, J. I., eds., Geochemical exploration: International Geochemical Exploration Symposium, 3rd, Toronto, 1970, Proceedings, Canadian Institute of Mining and Metallurgy Special Volume 11, p. 587–593, illus., **1971.** Regression shows the effects of variation of major elements and lithologies on trace metals and provides a means of adjusting background values. Data are from southeastern Pennsylvania.
7. Favorability for Cornwall-type magnetite deposits in Pennsylvania using geological, geochemical, and geophysical data in a discriminant function: Journal of Geochemical Exploration, v. 1, no. 2, p. 181–194, illus., **1972.** Geologic mapping, aeromagnetic surveys, and reconnaissance stream-sediment data were used to appraise the favorability of various parts of the Triassic basin for Cornwall-type deposits.

8. Chloride complexing of copper and silver in the origin of red bed copper, sandstone-type uranium and related ore deposits [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 7, p. 931–932, **1974.**
9. (and Smith, R. C., II). Assimilation of mantle and crust in the origin of Triassic diabase of eastern U.S. [abs.]: EOS (American Geophysical Union Transactions), v. 55, no. 4, p. 460, **1974.**
10. (and Keith, M. L.). Reconnaissance geochemical techniques for detecting uranium deposits in sandstones of northeastern Pennsylvania: Journal of Geochemical Exploration, v. 6, no. 1–2, p. 119–137, illus., **1976.** Tests on stream water and sediments near uranium deposits are reported. Stream sediments appear to be preferable to water for reconnaissance drainage surveys for uranium in the climatic conditions of eastern Pennsylvania.
11. (and Keith, M. L., and Suhr, N. H.). Geochemical drainage surveys for uranium: sampling and analytical methods based on trial surveys in Pennsylvania: U.S. Department of Energy Report GJO–1645–1 (GJBX–28–76), 33 p., illus., **1976** [not seen].
12. (and Schmiermund, R. L., and Mahar, D. L.). Geochemical dispersion of uranium near prospects in Pennsylvania: U.S. Energy Research and Development Administration Report GJO–1659–1 (GJBX–59–77), 88 p., illus., **1977.** Geological and geochemical studies near Penn Haven Junction, and the development and application of a method of determining the form of uranium in soils and stream sediments are among the major topics discussed.
13. Geochemical exploration for uranium in Pennsylvania: Earth and Mineral Sciences, v. 47, no. 7, p. 49–52, illus., **1978.** The geochemical portion of the National Uranium Resource Evaluation program is reviewed. The purpose is to discover new areas of uranium deposition and to evaluate them.
14. Uranium in northeastern United States [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 50–51, **1979.**
15. (and Korner, L. A.). Radon in natural waters as a guide to uranium deposits in Pennsylvania: International Geochemical Exploration Symposium, 7th, Proceedings, p. 65–75, illus., **1979** [not seen].

See also Gong, Henry, 2; Herrick, David C., 1; Howe, Stephen S., 1; Hsu, Fu-Tzu, 2; Korner, Lisa A., 2; McNeal, James M., 1; Pennington, Dennis L., 2, 3; Sevon, W. D., 16; Smith, Robert C., II, 2, 3, 5, 17.

ROSENQUEST, DARL

1. Slope stability and landslide hazards in the Squaw Run area watershed, Allegheny County, Pennsylvania: University of Pittsburgh, M.S. thesis, **1978.**

ROSS-BROWN, DERMOT

1. A subsidence investigation of a site above old anthracite workings in Pennsylvania, *in* Brawner, C. O., and Dorling, I. P. F., eds., Stability in coal mining: International Symposium on Stability in Coal Mining, 1st, Vancouver, Canada, 1978, Proceedings, San Francisco, Miller Freeman Publications, p. 251–269, illus., **1979.** The major part of the discussion deals with the stress analysis of the coal pillars located in the seven mined-out seams underlying this Scranton site. Some information about coal thicknesses and roof-rock lithology obtained from drill holes and examination of several of the mines is presented.

ROSWELL, CHARLES A., JR.

1. The form of water gaps: relationship to drainage evolution [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 214, **1973.**

ROUGH, ROBERT L.

1. (and Overbey, W. K., Jr.). Lithologic descriptions of Appalachian area oil-producing formations: U.S. Bureau of Mines Information Circular 8473, 133 p., illus., **1970.** Lithologic descriptions of oil-reservoir rocks of Silurian, Devonian, Mississippian, and Pennsylvanian age in Ohio, Pennsylvania, and West Virginia, which were cored as part of a study of secondary-recovery techniques, are presented along with maps and tables showing the geographic and stratigraphic sequence of the reservoirs, and information on geology, oil-field history, and reservoir-core analyses.

ROUSE, DANIEL E.

1. The petrography of the conglomerate members of the Knapp Formation, northwestern Pennsylvania: Meadville, Pa., Allegheny College, Senior thesis, **1978.**

ROWAN, L. C., *see* Podwysocki, M. H., 2.

ROWE, JACK J., *see* Gottfried, David, 1.

ROWLANDS, DAVID

1. The structure of the Broadtop synclinorium, Maryland and southcentral Pennsylvania: Morgantown, West Virginia University, M.S. thesis, **1971.**
2. (and Kanes, W. H.). The structural geology of a portion of the Broadtop synclinorium, Maryland and south-central Pennsylvania, *in* Lessing, Peter, and others, eds., Appalachian structures—origin, evolution, and possible potential for new exploration frontiers: West Virginia University and West Virginia Geological and Economic Survey, p. 195–225, illus., **1972.** Surface structure of anticlines and synclines changes at depth to low- and high-angle reverse faults in part controlled by an Upper Devonian décollement, whereas deformation at the Oriskany level is controlled by a décollement in the Martinsburg Formation. Basement is uninvolved.

RUBIN, MEYER, *see* Ray, Clayton E., 1.

RUDD, NEILSON

1. Subsurface liquid waste disposal and its feasibility in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 3, 103 p., illus., **1972.** The report is intended to provide a background for decisions that will be necessary in order to carry out a safe liquid-waste-disposal program.

RUSSELL, ALLAN, *see* King, John, 1.

RUSSELL, O. R.

1. (and Amato, R. V., and Leshendok, T. V.). Remote sensing and mine subsidence in Pennsylvania: American Society of Civil Engineers Proceedings, Transportation Engineering Journal, v. 105, no. TE2, p. 185–198, illus., **1979** [not seen].

RUSSNOW, ARTHUR L.

1. (and Beck, W. W., Jr., and Emrich, G. H.). Coal mine subsidence and mine pools—Northern Anthracite field, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 7, p. 1331–1332, **1975.**

RYAN, J. DONALD, *see* Zaki, Nabil, 1.

SAGUE, V. M.

1. Migmatite occurrences in the Wissahickon Formation and related rocks, Pennsylvania-Delaware Piedmont: Bryn Mawr, Pa., Bryn Mawr College, M.S. thesis, **1978.**

SAINES, MARVIN

1. Application of aeromagnetic maps to ground-water exploration in the Piedmont [abs.]: EOS (American Geophysical Union Transactions), v. 53, no. 11, p. 981, **1972.**

SALVER, HENRY A.

1. (and Gray, R. E.). Pleistocene and engineering geology of a portion of Erie County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 7, p. 763, **1970.**

See also Gardner, George D., 1.

SAMMIS, C., *see* Jordan, R. R., 2.

SAMSON, PETER L.

1. The geology of Valley Forge State Park, Valley Forge, Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Senior thesis, **1972.**
2. Valley Forge State Park—History of the rocks: Pennsylvania Geological Survey, 4th ser., Park Guide 8, pamphlet **[1974].** The geology of two different large regional belts can be seen in the park. The quartzite hills and broad dolomite valley are part of an upland that extends southwest of the park. The Triassic red beds in the northern part of the park underlie a lowland belt that stretches to the north.

SAMUELS, NEIL D., *see* Lundegard, Paul D., 1.

SANDERS AND THOMAS INC.

1. Wiconisco Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 170, 79 p., 15 p. appendix, illus., **1973.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

SANFORD, JOHN T.

1. Sub-Trenton structure of Ohio, with views on isopach maps and stratigraphic sections as basis for structural myths in Ohio, Illinois, New York, Pennsylvania, West Virginia, and Michigan: discussion: American Association of Petroleum Geologists Bulletin, v. 59, no. 9, p. 1689, **1975.**

SAPERSTEIN, LEE W., *see* Falkie, Thomas V., 1.

SAREWITZ, D. R.

1. The geology of the Martinsburg Formation, Slatedale 7.5 minute quadrangle, Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Bachelor's thesis, **1978.**

SARG, JOSEPH F.

1. Depositional environments of the Ames Limestone (Conemaugh Group) in the Pittsburgh area: University of Pittsburgh, M.S. thesis, **1971.**

2. Sedimentology of the Ames Limestone (Conemaugh Group) in the Pittsburgh (Pennsylvania) area—evidence for Virgilian eustatic rise in sea level [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 192, **1979.**

See also Carothers, Marshall C., 6.

SAUNDERS, R. STEPHEN, *see* Smith, Norman D., 2.

SAUNDERS, W. BRUCE

1. The Somoholitidae: Mississippian to Permian Ammonoidea: Journal of Paleontology, v. 45, no. 1, p. 100–118, illus., **1971.** The Somoholitidae are Late Paleozoic goniatitaceans, and include the genera *Neoshumardites* and *Somoholites.* By reference to diagnostic species, the somoholitids should prove to be reliable indices of discrete intervals within the Late Mississippian, Pennsylvanian, and Early Permian.

SAXENA, RAM S.

1. Petrology of some Allegheny Pennsylvanian rocks in eastern Ohio and western Pennsylvania: Baton Rouge, Louisiana State University, Ph.D. thesis, **1971;** [abs.], Dissertation Abstracts International, v. 32, no. 2, p. 1027B, **1971.**

See also Cavaroc, Victor V., Jr., 2.

SAYLOR, TIMOTHY E., *see* Hoover, Karl V., 3; Lapham, Davis M., 4.

SBAR, M. L., *see* Jordan, R. R., 2.

SCHADEL, A., *see* Cunningham, Robert L., 1.

SCHAEFER, K.

1. Recent thrusting in the Appalachians: Nature, v. 280, no. 5719, p. 223–226, illus., **1979** [not seen].

SCHAMEL, STEVEN, *see* Albala, David M., 1.

SCHARNBERGER, CHARLES K.

1. Another Lancaster County earthquake: Pennsylvania Geology, v. 9, no. 6, p. 2–5, illus., **1978.** Report of the second quake that shook Lancaster County in 1977.
2. The Lancaster County earthquake of July 16, 1978: Pennsylvania Geology, v. 9, no. 5, p. 2–5, illus., **1978.** Geologic features related to earthquakes are reviewed; the Lancaster County earthquake is emphasized.
3. (and Nichols, P. H., and Bria, J. J.). Diabase dikes in Lancaster County, Pennsylvania: evidence of Late Triassic shear [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 52, **1979.**

SCHASSE, HENRY W.

1. The geology and mineral deposits of Jacks Mountain, in the Mount Union and Butler Knob 7½-minute quadrangles, central Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1978.**
2. Anomalies in the southern termination of the Kishacoquillas-Jacks Mountain anticlinorium, central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 52, **1979.**

SCHENCK, H.

1. Archaeological prospecting at Valley Forge: MASCA (Museum Applied Science Center for Archaeology) Journal, v. 1, no. 1, p. 16–17, illus., **1978** [not seen].

SCHENK, GEORGE H. K., *see* MacKallor, Jules A., 1.

SCHINER, GEORGE R.

1. (and Kimmel, G. E.). Mississippian stratigraphy of northwestern Pennsylvania: U.S. Geological Survey Bulletin 1331–A, p. A1–A27, illus., **1972.** The Mississippian strata of the Shenango and Stoneboro 15-minute quadrangles and adjacent areas are described and their subsurface extent and variations are shown. The authors clarify ambiguities in previous stratigraphic correlations.
2. (and Kimmel, G. E.). Geology and ground-water resources of northern Mercer County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 33, 136 p., illus. including geologic maps, **1976.** The bedrock is of Devonian, Mississippian, and Pennsylvanian age. The principal aquifers are the thick sandstone formations of Mississippian and Pennsylvanian age and the glacial outwash deposits of Pleistocene age. Detailed data from about 2,000 wells are included.
3. (and Gallaher, J. T.). Geology and hydrology of western Crawford County, Pennsylvania: U.S. Geological Survey Open-File Report 78–204, 174 p., illus., **1978** [not seen].
4. (and Gallaher, J. T.). Geology and groundwater resources of western Crawford County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 46, 103 p., illus. including geologic map, **1979.** The bedrock, mapped in detail, is of Devonian, Mississippian, and Pennsylvanian age. The most productive aquifers are those in glacial outwash. The chief water-quality problems are salty water, high iron concentrations, high hardness, and dissolved gases.

See also Buckwalter, Theodore F., 1; Kimmel, Grant E., 1.

SCHLOSS, ANDRES M.

1. (and Jordan, V. D. F.). Geology of the East Manchester-Codorus Creek area: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1971.**

SCHLOSSMAN, S., *see* Gibbons, John R., 1.

SCHMERLING, DON, *see* Annē, Martin L., 2.

SCHMIDT, VICTOR A.

1. The paleohydrology of Laurel Caverns, Pennsylvania, *in* Rauch, H. W., and Werner, Eberhard, eds., Proceedings of the Fourth Conference on Karst Geology and Hydrology [Morgantown, W. Va., 1974]: West Virginia Geological and Economic Survey, p. 123–128, illus., **1974.** The paleohydrology of the caverns is not very different from the present hydrologic setting and is related to the present topography. The caverns are located within the 50-foot-thick Loyalhanna and Deer Valley limestones in Fayette County.
2. The paleohydrology of Laurel Caverns, Pennsylvania, *in* Garton, Ray, ed., 1976 Annual Convention guidebook: Morgantown, W. Va., National Speleological Society, p. 32–35, illus., **1976.** The development of the caverns is related to past hydrologic conditions that apparently differ little from those of today.

See also Baier, E., 1; Cain, Bruce, 2; Luce, R., 1; Payne, Michael A., 1, 3.

SCHMIERMUND, R. L.

1. Geology and geochemistry of uranium deposits near Penn Haven Junction, Carbon County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1977.**

See also Rose, Arthur W., 12.

SCHMOTZER, J. K.

1. (and Jester, W. A., and Parizek, R. R.). Groundwater tracing with post sampling activation analysis: Journal of Hydrology, v. 20, no. 3, p. 217–236, illus., **1973.** A tracing technique was developed that involved the use of a low concentration of a nonradioactive tracer, the bromide ion. It provided a means to follow the travel of water within the groundwater, soil-water, and surface-water reservoirs.

SCHNACK, JACK

1. A study of the Bartholomew Siltstone Member of the Orangeville Shale: Meadville, Pa., Allegheny College, Bachelor's thesis, **1974.**

SCHOLLE, PETER A.

1. A color illustrated guide to carbonate rock constituents, textures, cements, and porosities: American Association of Petroleum Geologists Memoir 27, 241 p., illus., **1978.** This volume contains photographs that illustrate the major grains, textures, cements, and porosity types found in carbonate rocks. Samples taken from Pennsylvania are included throughout the work.

SCHOOLER, ELIZABETH EVANS

1. Pleistocene beach ridges of northwestern Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 64, 38 p., illus. including geologic map, **1974.** A detailed report on the nature and origin of beach ridges of Erie County. Based on field mapping of beach ridges and other lake and glacial features, as well as laboratory research, the author established the sequence of glacial events and the history of development of proglacial lakes in the Erie basin. A detailed map of the surficial geology of the Harborcreek quadrangle (Erie County) is also included.
2. Pennsylvania—A geological gem: Rocks and Minerals, v. 53, no. 3, p. 94–98, illus., **1978.** A summary article dealing with the geological and geographical background of Pennsylvania.

See also Evans, Elizabeth L.

SCHOPP, R. D.

1. (and Gillespie, B. D.). Selected streamflow data for the Delaware River basin: U.S. Geological Survey Open-File Report 79-347, 15 p., illus., **1979** [not seen].

SCHRIDER, L. A., *see* Frohne, K.-H., 1.

SCHROCK, RONALD, *see* Revell, Stephen, 1.

SCHROCK, WILLIAM W.

1. Some aspects of the stratigraphy of the Mahantango Formation: Huntingdon, Pa., Juniata College, Senior paper, **1972.**

SCHRYBA, WILLIAM K.

1. Field criterion and size analysis as means of correlating Kent, Titusville, and Mapledale Till: Meadville, Pa., Allegheny College, Bachelor's thesis, **1973.**

SCHRYVER, ROBERT F., *see* Arndt, Harold H., 3.

SCHUBERT, JEFFREY P.

1. A hydrogeologic and numerical simulation feasibility study of connector well dewatering of underground coal mines, Madera, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1978.**
2. Reducing water leakage into underground coal mines by aquifer dewatering, *in* Fernandez-Rubio, R., and others, eds., El agua en la mineria y trabajos subterraneos: Asociacion Nacional Ingenieros de Minas, Spain, v. 1-3, p. 911-931, illus., **1978** [not seen].

SCHUECK, J. H.

1. Harrisburg river relief route excavation slopes, Blue Mountain and Little Mountain, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 174-186, illus., **1978.** The design and construction of this highway, including engineering and geologic problems encountered, are reviewed.
2. Presplit excavation slope, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 196-199, illus., **1978.** The quality of presplit blasting in two ½:1 excavation slopes in the Mahantango Formation is discussed.
3. (and Branthoover, G. L.). Use of controlled blasting in excavation slopes, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 222-226, illus., **1978.** Summary article of unstable slope conditions at a highway excavation in the Juniata Formation.

SCHULTZ, LANE D.

1. The stratigraphy of the Trimmers Rock Formation in northeastern Pennsylvania: Bethlehem, Pa., Lehigh University, Ph.D. thesis, **1974**; [abs.], Dissertation Abstracts International, v. 35, no. 8, p. 3991B, **1975.**

SCHWARTZ, ROBERT K.

1. Stratigraphic properties of some small-scale washover sand bodies [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 263, **1976.**

SCHWEINFURTH, STANLEY P.

1. (and Kent, B. H., and Roen, J. B.). Geology and land use in eastern Washington County, Pennsylvania, California and Monongahela 7½-minute quadrangles: Pennsylvania Geological Survey, 4th ser., General Geology Report 56A, scale 1:24,000, 2 sheets, **1971.** Lithologies of Quaternary, Permian, and Pennsylvanian rocks are mapped. Thicknesses of coal are indicated. Structure contours on the base of the Pittsburgh coal are also included.
2. Geologic map of the West Middletown quadrangle, and part of the Bethany quadrangle, Washington County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-871, scale 1:24,000, **1975.** Pennsylvanian and Permian rocks and Quaternary deposits were mapped. Structure contours on the base of the Pittsburgh coal bed are shown. Coal is the principal economic mineral resource present in the area.
3. Geologic map of the Avella quadrangle and part of the Steubenville East quadrangle, Washington County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-908, scale 1:24,000, **1976.** See annotation in entry 2 above.

See also Berryhill, Henry L., Jr., 1.

SCIENCE

1. Geologists rebuild after flood: Science, v. 178, no. 4057, p. 139, **1972.** The destruction of the Pennsylvania Geological Survey headquarters by tropical storm Agnes and subsequent rebuilding efforts are summarized.

SCLAR, CHARLES B., *see* Basu, Debabrata, 1.

SCOTT, ROBERT W.

1. Eurypterid from the Dunkard Group (Pennsylvanian and Permian), southwestern Pennsylvania: Journal of Paleontology, v. 45, no. 5, p. 833–837, illus., **1971.** The first reported occurrence of *Adelopthalmus mansfieldi* (C. E. Hall) in the basal Dunkard Group in Greene County supports the classification of basal Dunkard rocks as partly Pennsylvanian in age.

SEAMAN, S. J.

1. The lowermost unit of the Spechty Kopf Formation: composition and possible source areas: Bryn Mawr, Pa., Bryn Mawr College, Senior paper, **1979.**

SEARS, STEPHEN O.

1. (and Deines, P., and Langmuir, D.). Geochemistry of recharge water in the unsaturated zone of a carbonate terrane [abs.]: EOS (American Geophysical Union Transactions), v. 56, no. 6, p. 359, **1975.**
2. Inorganic and isotopic geochemistry of the unsaturated zone in a carbonate terrane: University Park, Pennsylvania State University, Ph.D. thesis, **1976;** [abs.], Dissertation Abstracts International, v. 37, no. 5, p. 2119B, **1976.**
3. (and Deines, Peter, and Langmuir, Donald). Relationships between the isotopic composition of soil moisture, ground water and precipitation collected for one year in central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 1095–1096, **1976.**

See also Langmuir, Donald, 8.

SECOR, EDWIN S.

1. (and Larwood, G. M., Gupta, A. B., and Lees, A. S.). Coal recovery from bituminous coal surface mines in the eastern United States, a survey: U.S. Bureau of Mines Information Circular 8738, 14 p., illus., **1977.** Estimated levels of coal recovery are given for bituminous coal strip and auger mines in the eastern United States. Twenty-four mines in Pennsylvania were included in the survey. The recovery estimates are related to various mining methods, and ratios of overburden to coal are given. The mean percentage of total recovery for the Pennsylvania mines was 81.9.

SEELAND, DAVID A.

1. A geochemical reconnaissance for gold in the sedimentary rocks of the Great Lakes region, Minnesota to New York: U.S. Geological Survey Bulletin 1305, 16 p., illus., **1973.** Atomic absorption analyses indicate an absence of fossil placers and relatively abundant but noneconomic amounts of gold in marble and glauconitic sandstone in the study area. Four samples from northwestern Pennsylvania are included in the study.

SEIDERS, VICTOR M.

1. Discussion, *in* Age, origin, regional relations, and nomenclature of the Glenarm Series, central Appalachian Piedmont: a reinterpretation: discussion and reply: Geological Society of America Bulletin, v. 87, no. 10, p. 1519–1522, illus., **1976.**

SETTZO, LYNNE

1. The Keefer Sandstone—a study of the ironstone beds: Lewisburg, Pa., Bucknell University, Senior thesis, **1973.**

SEVON, JOAN J.

1. Flooding and flood protection at Harrisburg: Pennsylvania Geology, v. 7, no. 1, p. 4–9, illus., **1976.** Flooding in Harrisburg has occurred repeatedly, and severe damage has resulted. Flood protection is discussed and current plans are reviewed.
2. Living with our stone industry: Pennsylvania Geology, v. 8, no. 5, p. 4–7, illus., **1977.** A satisfying environment can be developed through cooperation of the industry and citizens. Suggestions are given and examples cited of both groups working together.

SEVON, WILLIAM D.

1. Mississippian unconformity in northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 35–36, **1970.**
2. Palmerton Sandstone as a source of sand in Carbon and northeastern Schuylkill Counties, Pennsylvania, *in* Hoover, K. V., ed., Proceedings, Fifth Forum on Geology of Industrial Minerals [Harrisburg, Pa., 1969]: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 64, p. 119–137, illus., **1970.** Nearly one-half million tons of general use and refractory sand is produced yearly from the Middle Devonian Palmerton Sandstone between Little Gap (Carbon County) and Andreas (Schuylkill County). Ideal quarry sites occur in the plunging antiform structures.
3. Late Wisconsinan periglacial boulder deposits in northeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 43–44, **1972.**
4. The flood and the Survey: Pennsylvania Geology, v. 3, no. 4, p. 21–29, illus., **1972.** Summary of the flooding caused by tropical storm Agnes and its effect on the Pennsylvania Geological Survey.
5. 'Early' Wisconsinan drift in Lycoming County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 218, **1973.**
6. Glaciation and sedimentation in the Late Devonian and Early Mississippian of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 218–219, **1973.**
7. Relative age and sequence of glacial deposits in Carbon and Monroe Counties, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 71, **1974.**
8. Geology and mineral resources of the Christmans and Pohopoco Mountain quadrangles, Carbon and Monroe Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 195ab, illus. including geologic maps, scale 1:24,000, 2 sheets, **1975.** The bedrock units range in age from Middle Devonian (Marcellus Formation) to Mississippian (Mauch Chunk Formation). The environmental characteristics of the bedrock and surficial units and their potential for mineral resources are discussed.
9. Geology and mineral resources of the Hickory Run and Blakeslee quadrangles, Carbon and Monroe Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 194cd, illus. including geologic maps, scale 1:24,000, 2 sheets, **1975.** The bedrock units range in age from Late Devonian (Catskill Formation) to Mississippian (Mauch Chunk Formation). The environmental characteristics of the bedrock and surficial units and their potential for mineral resources are discussed.

10. Geology and mineral resources of the Tobyhanna and Buck Hill Falls quadrangles, Monroe County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 204ab, illus. including geologic maps, scale 1:24,000, 2 sheets, **1975.** Bedrock consists of members of the Upper Devonian Catskill Formation. The environmental characteristics of the bedrock and surficial units and their potential for mineral resources are discussed.
11. Sandstone saprolite, roundstone diamicton and the Harrisburg peneplain in eastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 118, **1975.**
12. (and Crowl, G. H., and Berg, T. M.). The late Wisconsinan drift border in northeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 40th, Bartonsville, Pa., Guidebook, 108 p., illus., **1975.** The purpose of the conference was to demonstrate the following in northeastern Pennsylvania: (1) the character and variability of the late Wisconsinan drift materials; (2) the similarities and differences between the late Wisconsinan (Woodfordian) drift and pre-late Wisconsinan–post Sangamonian (Altonian) drift; (3) the character of the Illinoian glacial drift; (4) the character of deposits of periglacial origin; and (5) the reasoning used in differentiating and dating the various deposits.
13. Bluestone in Pike County, Pennsylvania: Pennsylvania Geology, v. 9, no. 3, p. 2–7, illus., **1978.** The attributes of bluestone and the potential for renewed production are discussed.
14. Flagstones in Pike County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 85, **1978.**
15. (and Berg, T. M.). Geology and mineral resources of the Skytop quadrangle, Monroe and Pike Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 214a, 33 p., illus. including geologic map, **1978.** Bedrock consists of the Packerton and Long Run Members of the Catskill Formation (Upper Devonian). Unconsolidated surficial deposits mask the bedrock in about 50 percent of the area. There is moderate groundwater potential only in the Long Run Member. Sand and gravel is the main mineral resource in the area.
16. (and Rose, A. W., Smith, R. C., II, and Hoff, D. T.). Uranium in Carbon, Lycoming, Sullivan, and Columbia Counties, Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 43rd, Hazleton, Pa., Guidebook, 99 p., illus., **1978.** A discussion of sedimentological and geochemical models that account for the primary distribution of the uranium minerals and their enclosing rocks and a postdepositional model that explains the present localizations of those minerals. Includes 10 stop descriptions.
17. Devonian sediment-dispersal systems in Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 53, **1979.**
18. Polymictic diamictites in the Spechty Kopf and Rockwell Formations, *in* Dennison, J. M., and others, Devonian shales in south-central Pennsylvania and Maryland: Annual Field Conference of Pennsylvania Geologists, 44th, Bedford, Pa., Guidebook, p. 61–66, illus., **1979.** Polymictic diamictite is a rare rock in the Paleozoic sequence of Pennsylvania. The known occurrences are within the Spechty Kopf Formation in central and northeastern Pennsylvania and the Rockwell Formation in south-central Pennsylvania and northern Maryland. A sedimentologic model is suggested to account for the diamictites in these two laterally equivalent formations.
19. (and Berg, T. M.). Pennsylvania shale-chip rubble: Pennsylvania Geology, v. 10, no. 6, p. 2–7, illus., **1979.** The formation of shale-chip rubble is widespread in central and eastern Pennsylvania. The deposits, mined in some areas, are the result of downslope accumulation of fragments formed by natural disintegration of

several different shale units, principally the Martinsburg Formation and the Hamburg sequence of the Great Valley, and the Antes, Reedsville, Marcellus, and Mahantango Formations of the Valley and Ridge province.

See also Berg, Thomas M., 5, 9; Connally, G. Gordon, 2; Dennison, John M., 13; Edmunds, William E., 10; Epstein, Jack B., 8, 11; Evenson, Edward B., 1; Faill, Rodger T., 14, 15; Hoskins, Donald M., 9.

SEYMOUR, E. H., JR.

1. Seismic refraction study of the Delaware River valley fill sequence, near Bushkill, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

SHAAK, GRAIG D.

1. Species diversity and community structure of the Brush Creek marine interval, (Conemaugh Group, Upper Pennsylvanian) in the Appalachian basin of western Pennsylvania: University of Pittsburgh, Ph.D. thesis, **1972**; [abs.], Dissertation Abstracts International, v. 33, no. 8, p. 3831B, **1973.**
2. (and Rollins, H. B.). Reflection of community standing crop in Pennsylvanian faunal assemblages [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 7, p. 661, **1972.**
3. Diversity and community structure of the Brush Creek marine interval (Conemaugh Group, Upper Pennsylvanian) in the Appalachian basin of western Pennsylvania: Florida State Museum Bulletin, Biological Sciences, v. 19, no. 2, p. 69–133, **1975.**

See also Donahue, Jack D., 1; Morris, Robert W., 1.

SHACKLETON, R. D.

1. (and Roberts, K. C.). Medusa's reclamation programs in three states, *in* Tenth Forum on Geology of Industrial Minerals [Columbus, Ohio, 1974], Proceedings: Ohio Division of Geological Survey Miscellaneous Report 1, p. 13–16, **1974.** Discussion of Medusa Cement Company's quarry operations in Georgia, Pennsylvania, and Illinois, and each state's laws regulating mining and reclamation.

SHALLER, R. B., *see* Buck, R. J., 1.

SHAPIRO, EARL A.. *see* Gillette, David D., 5.

SHARKEY, A. G., JR., *see* Kessler, Theodore, 1, 2.

SHAUB, F. JEANNE

1. Interpretation of a gravity profile across the Gettysburg Triassic basin: University Park, Pennsylvania State University, M.S. thesis, **1975.**
2. (and Lavin, P. M.). Gravity profile across the Gettysburg Triassic basin [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 53, **1979.**

SHAW, JEFFREY W.

1. Structure and stratigraphy of the Hamburg klippe from Port Clinton, Pennsylvania to Shoemakerville, Pennsylvania: Princeton, N. J., Princeton University, Senior thesis, **1973.**

SHAW, L. C.

1. (and Busch, W. F.). Pennsylvania gazetteer of streams, Part I: Pennsylvania Department of Forests and Waters [now Department of Environmental Resources], Water Resources Bulletin 6, 280 p., illus., **1970.** Information is presented for 6,973 named streams in Pennsylvania, including (1) a listing of the streams in downstream order and the drainage area of each stream at its mouth; and (2) an alphabetical

listing of the streams containing site name, county, latitude and longitude, name of 7½-minute quadrangle maps in which the stream occurs, and drainage area.
See also Busch, W. F., 1; Page, L. V., 1, 2.

SHEAFFER, KARL K.

1. The impact of surface mining on the hydrologic environment of the Big Sandy Creek watershed, Fayette County, Pennsylvania, *in* Samuel, D. E., and others, eds., Surface mining and fish/wildlife needs in the eastern United States—Addendum to proceedings of a symposium: U.S. Department of the Interior, Fish and Wildlife Service, Report FWS/OBS-78/81 A, p. 91-98, illus., **1979.** Continuous monitoring of benthic macroinvertebrates, fish, and various physical/chemical parameters at several sites along Stony Fork indicate no environmental stress as a result of current strip mining and provide a data base for future evaluation.

SHEARROW, GEORGE G.

1. Sub-Trenton structure of Ohio, with views on isopach maps and stratigraphic sections as basis for structural myths in Ohio, Illinois, New York, Pennsylvania, West Virginia, and Michigan: discussion: American Association of Petroleum Geologists Bulletin, v. 59, no. 6, p. 1022-1023, **1975.**

SHELTON, BILL

1. (and Webster, Bud). Mineral collector's field guide—the Northeast: Mineralogy, Wallingford, Conn., 137 p., illus., **1979.** The Faylor Middlecreek quarry in Winfield (Union County), famous for strontianite specimens, and the Meckley quarry, an active limestone quarry in Herndon (Northumberland County), famous for celestite crystals, are included in this guidebook. Location maps are also included.

SHEPPS, VINCENT C., *see* Glass, Gary B., 8.

SHERTZER, RICHARD, *see* Brenner, Fred J., 1.

SHERWIN, JO-ANN

1. Wavelength of folds in the Allegheny Plateau [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 36, **1970.**

SHIPP, R. F., *see* Cunningham, Robert L., 1.

SHIREY, STEVEN B., *see* Padovani, Elaine R., 1.

SHIRK, WILLIAM R.

1. The geology of southcentral Pennsylvania: National Association of Geology Teachers, Eastern Section, Spring Meeting, Shippensburg, Pa., Shippensburg State College, 1978, Guidebook, 73 p., illus., **1978.** The author presents the preliminary findings of a field study and literature search dealing with the general geology and selected site analyses of various sections of the Great Valley, Blue Ridge, and Triassic Lowland areas of south-central Pennsylvania. The field trip covers over 83 miles and includes 15 stops in Cumberland, Franklin, and Adams Counties.
See also Geyer, Alan R., 6.

SHOLES, MARK A.

1. (and Skema, V. W., compilers). Bituminous coal resources in western Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 68, 13 coal-distribution maps, scale 1:250,000, **1974.** The distribution and thickness

of each of Pennsylvania's 13 major bituminous coals are presented. Thickness and reliability categories are as follows: (1) coal mined out; (2) coal greater than 28 inches in thickness (measured or indicated); (3) coal less than 28 inches in thickness (measured or indicated); and (4) coal less than 28 inches in thickness (inferred).

2. Ancient river a possible hazard to coal mining: Pennsylvania Geology, v. 8, no. 1, p. 12–13, illus., **1977.** Because they represent possible hazards to coal mining, ancient river beds should be located before mining starts. An example in the Kittanning Sandstone in the Philipsburg-Ramey area is described.
3. (and Edmunds, W. E., and Skema, V. W.). The economic geology of the Upper Freeport coal in the New Stanton area of Westmoreland County, Pennsylvania: a model for coal exploration: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 75, 51 p., illus., **1979.** A case study of a small area in which modern stratigraphic and sedimentologic concepts have been applied to evaluate the physical properties of the Upper Freeport and associated rocks in order to guide exploration and provide maximum mine-planning data. The authors emphasize the kinds of information necessary to effectively evaluate coal and associated rocks for mining potential.

See also Edmunds, William E., 9; Glass, Gary B., 8; Skema, Viktoras W., 1, 2.

SHORE, ROCHELLE C.

1. The conodont fauna and paleoecology of the Chambersburg Formation (Middle Ordovician) of south-central Pennsylvania [abs.]: Missouri Academy of Science Transactions, v. 5, p. 139, **1971.**
2. The conodont fauna and paleoecology of the lower Chambersburg Formation (Middle Ordovician) of south-central Pennsylvania: Columbia, University of Missouri, M.A. thesis, **1971.**

SHUCK, L. Z.

1. (and Keech, T. W.). Monitoring acoustic emission from propagating fractures in petroleum reservoir rocks: Series on Rock and Soil Mechanics, v. 2, no. 3, p. 309–338, illus., **1977** [not seen].

See also Greenfield, R. J., 2; Komar, C. A., 1.

SHUFFLEBARGER, T. E., JR.

1. Glass sand operations, Mapleton Depot-McVeytown area, *in* Branthoover, G. L., field trip chairman, Field trip guidebook, 1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 208–211, illus., **1978.** A brief geologic description of the area is provided. Two quarry operations, the Hatfield works (closed) and the Keystone Works, are discussed. The quarries are in the Ridgeley Sandstone Member ("Oriskany" Formation).

SHULIK, S., *see* Cain, Bruce, 2; Payne, Michael A., 1.

SHULITS, S.

1. Fluvio-morphologic consequences of a constriction at the entrance to a river bend: International Association for Hydraulic Research, Congress, 14th, Proceedings, v. 3, p. 137–144, illus., **1971** [not seen].

SHULTZ, CHARLES H.

1. Pennsylvania iron: foundation of the American Revolution: Pennsylvania Geology, v. 8, no. 5, p. 8–13, illus., **1977.** A historical account of the iron industry in Pennsylvania during the revolution.

SHUMAC, KAREN

1. (and Piotrowski, Robert). Exploratory drilling in Pennsylvania indicates substantial reserves of natural gas: Pennsylvania Geology, v. 9, no. 2, p. 2–5, illus., **1978.** The success of a drilling program in western Pennsylvania is reported.
2. (and Piotrowski, Robert). Good gas reserves indicated in Pennsylvania: Oil and Gas Journal, v. 76, no. 8, p. 155–156, illus., **1978.** Results from test wells drilled in southwestern and central Pennsylvania indicate that Pennsylvania has excellent gas production potential.

SHUMAKER, R. C.

1. Influence of Salina salt on structure in New York-Pennsylvania: discussion: American Association of Petroleum Geologists Bulletin, v. 58, no. 3, p. 543–544, **1974.**

See also Donaldson, Alan C., 5.

SHUSTER, EVAN T.

1. Seasonal variations in carbonate spring water chemistry related to ground-water flow: University Park, Pennsylvania State University, M.S. thesis, **1970.**
2. (and White, W. B.). Seasonal fluctuations in the chemistry of limestone springs: a possible means for characterizing carbonate aquifers: Journal of Hydrology, v. 14, no. 2, p. 93–128, illus., **1971.** Dissolved carbonates were analyzed in the waters of 14 carbonate springs in the central Appalachians. It was concluded that aquifer systems having quite different flow mechanics can exist in the same hydrogeologic environment and can be distinguished by their chemical behavior.
3. (and White, W. B.). Seasonal variations in ground-water chemistry, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 121–126, illus., **1971;** Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 121–126, illus., **1971.** Fourteen carbonate springs were sampled for principal chemical constituents at two-week intervals for a complete water year. Different responses in temperature and hardness divided the springs into roughly two groups, diffuse flow and conduit flow.
4. (and White, W. B.). Source areas and climatic effects in carbonate waters determined by saturation indices and carbon dioxide pressures [abs.]: Caves and Karst, v. 13, no. 6, p. 49, **1971.**
5. (and White, W. B.). Source areas and climatic effects in carbonate groundwaters determined by saturation indices and carbon dioxide pressures: Water Resources Research, v. 8, no. 4, p. 1067–1073, illus., **1972.** Diffuse-flow and conduit-flow spring waters in the Ordovician limestones and dolomites of the Nittany Valley were analyzed and compared.
6. Current status of Pennsylvania's water well inventory: Pennsylvania Geology, v. 4, no. 3, p. 9–11, illus., **1973.** Well records for 46 counties have been incorporated into a computerized data retrieval system. Information is available for all counties.
7. Landslides: an early spring hazard or the creep that wouldn't slow down: Pennsylvania Geology, v. 4, no. 1, p. 2–4, illus., **1973.** When water tables become high and soils are saturated, landslides become a potential problem along hillsides and roadcuts.
8. Sinkholes—a constant problem: Pennsylvania Geology, v. 4, no. 2, p. 2–3, illus., **1973.** A sinkhole near Mechanicsburg, Cumberland County, is discussed.

9. Current status of Bureau's water well inventory: Pennsylvania Geology, v. 6, no. 5, p. 11–13, **1975.** Computerized water well data are available for all counties except Philadelphia and Crawford.
10. Groundwater resources of the DuBois area, Clearfield and Jefferson Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 45, scale 1:48,000, 2 sheets, **1979.** Detailed maps show major geologic units, groundwater yields and water quality associated with each unit, depth to the water table, and depth to the top of subsurface salt water in the area.

SIBLEY, DUNCAN F.

1. (and Blatt, Harvey). Quantitative evaluation of intergranular pressure solution as a source of silica in the Tuscarora orthoquartzite, central Appalachians [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 7, p. 954, **1974.**

SIDDIQUI, SHAMSUL H.

1. Hydrogeologic factors influencing well yields and aquifer hydraulic properties of folded and faulted carbonate rocks in central Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1969;** [abs.], Dissertation Abstracts International, v. 31, no. 2, p. 764B, **1970.**
2. (and Parizek, R. R.). An application of parametric statistical tests to well-yield data from carbonates of central Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 52, no. 4, p. 206, **1971.**
3. (and Parizek, R. R.). Hydrogeologic factors influencing well yields in folded and faulted carbonate rocks in central Pennsylvania: Water Resources Research, v. 7, no. 5, p. 1295–1312, illus., **1971.** Well-yield data were collected from 80 wells, and 15 hydrogeologic and hydraulic variables were considered as possible controls on well yields in the folded and faulted sequence of interbedded limestones, shaly limestones, shales, dolomites, and sandy dolomites of Early Paleozoic age.
4. (and Parizek, R. R.). Variations in well yields and controlling hydrogeologic factors, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 87–95, illus., **1971;** Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 87–95, illus., **1971.** Variations in bedrock lithology and dip, topographic position, depth to static water level, proximity to anticlinal and synclinal axes, and fracture traces were examined for 80 wells in Nittany and Penns Valleys.
5. (and Parizek, R. R.). An application of parametric statistical tests to well-yield data from carbonates of central Pennsylvania: Journal of Hydrology, v. 21, no. 1, p. 1–14, **1974.** Variations in productivity of 80 water wells located in folded and faulted carbonate rocks and shales of Cambro-Ordovician age in central Pennsylvania were related to hydrogeologic factors. The variations in rock type and number of fracture traces were thought to be more important than other structural variations.

SIEVER, RAYMOND, *see* Pettijohn, F. J., 1.

SIMMONS, GENE, *see* Padovani, Elaine R., 1.

SINHA, AKHAURY K., *see* Higgins, Michael W., 6.

SIRKIN, LESLIE A., *see* Connally, G. Gordon, 2.

SKELLY AND LOY

1. Alder Run mine drainage pollution abatement project: Pennsylvania Department of Mines and Mineral Industries, Operation Scarlift Project SL 143, 108 p., illus., **1970.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.
2. Muddy Run mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 155, 239 p., illus., **1971.** See annotation in entry 1 above.
3. Clearfield Creek & Moshannon Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 1-73:1-101.7, 342 p., illus., **1973.** See annotation in entry 1 above.
4. Coal mine drainage in the Susquehanna River basin: Susquehanna River Basin Commission, 297 p., illus. including environmental geologic map, **1973.** A thorough discussion of coal mine drainage, including its origin, impact, abatement, and the benefits associated with its reclamation. All significant bituminous and anthracite coal mine drainage areas are identified and discussed.
5. Coal mine drainage in the Susquehanna River basin—Executive summary: Susquehanna River Basin Commission, 49 p., illus., **1973.** All areas in the basin that have significant coal mine drainage are identified and described in qualitative and quantitative terms. Abatement measures and associated costs are discussed as well as the benefits of reclamation.
6. Newport Creek mine drainage pollution abatement project: Pennsylvania Department of Environmental Resources, Operation Scarlift Project SL 181-2, 105 p., illus., **1974.** See annotation in entry 1 above.

SKEMA, VIKTORAS W.

1. (and Berg, T. M., Bragonier, W. A., Edmunds, W. E., Glass, G. B., Glover, A. D., Inners, J. D., and Sholes, M. A.). Analyses and measured sections of Pennsylvania bituminous coals, Part II: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 69, 306 p., illus., **1975.** The data on coal, particularly thickness, chemical analyses, and coking and fusibility characteristics, should be helpful for preliminary evaluation of the potential use of specific coal seams. Also included is lithologic, paleontologic, mineralogic, and structural information.
2. (and Edmunds, W. E., Glover, A. D., Inners, J. D., and Sholes, M. A.). Analyses and measured sections of Pennsylvania bituminous coals, Part III: Pennsylvania Geological Survey, Mineral Resource Report 74, 272 p., illus., **1977.** See annotation in entry 1 above.

See also Edmunds, William E., 9; Sholes, Mark A., 1, 3.

SLATER, GEORGE E.

1. Importance of underground gas storage in Pennsylvania: Earth and Mineral Sciences, v. 40, no. 8, p. 58-60, 62, illus., **1971.**

SLATICK, EUGENE R.

1. Pennsylvania's mountains: Pennsylvania Game News, v. 50, no. 6, p. 11-13, illus., **1979.** A nontechnical description of the processes that formed the mountains of Pennsylvania.

SLAUGHTER, JOHN

1. Genesis of stratiform copper deposits of the Catskill Formation of northern Pennsylvania: New Brunswick, N. J., Rutgers University, M.S. thesis, **1970.**

SLAWSON, G. C., JR., *see* Engman, Edwin T., 3.

SLINGERLAND, RUDY L.

1. Transportation and hydraulic equivalence relationships of light and heavy minerals in sands: University Park, Pennsylvania State University, M.S. thesis, **1973.**
2. The effects of entrainment on the hydraulic equivalence relationships of light and heavy minerals in sands: Journal of Sedimentary Petrology, v. 47, no. 2, p. 753–770, illus., **1977.** A semi-empirical critical velocity equation and critical suspension velocity equation have been developed to explain the settling velocity relationships and concentrations of light and heavy minerals in sands. Presque Isle beach sands were used in the analysis.

SLOTO, RONALD A., *see* McGreevy, Laurence J., 1, 2.

SMELTZER, B.

1. Schofer Cave: York Grotto Newsletter, v. 16, no. 2, p. 26–29, illus., **1979** [not seen].

SMITH, ALLAN

1. A morphometrical analysis of Chillisquaque Creek and structural studies of the Montour Ridge anticline: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

SMITH, CARL J., *see* Cole, Gary A., 1.

SMITH, DANIEL

1. Geology of the West Willow-Burnt Mills area: Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1971.**

SMITH, DONALD M.

1. (and Mortensen, M. E.). Geology of the East Prospect area, York County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1971.**

SMITH, KATHERINE M., *see* Gale, William F., 1.

SMITH, NORMAN D.

1. The braided stream depositional environment: comparison of the Platte River with some Silurian clastic rocks, north-central Appalachians: Geological Society of America Bulletin, v. 81, no. 10, p. 2993–3013, illus., **1970.** Relative abundances of planar cross stratification and horizontal stratification were measured in sandstones and conglomerates of the Shawangunk Formation, Green Pond Conglomerate, and Tuscarora Formation in Pennsylvania and New Jersey. The formations display downslope trends similar to those of the South Platte and Platte Rivers. Combined with paleocurrent, grain-size distribution, and other data, these trends suggest that the coarse eastern facies (Green Pond, Shawangunk) represent proximal braided-stream deposits which grade westward and northwestward into finer grained distal braided-stream sediments (Tuscarora).
2. (and Saunders, R. S.). Paleoenvironments and their control of acritarch distribution: Silurian of east-central Pennsylvania: Journal of Sedimentary Petrology, v. 40, no. 1, p. 324–333, illus., **1970.** Four environments were recognized: open marine, barrier bar, tidal flat-lagoonal, and fluvial. The acritarchs are confined to depositional areas continuously or intermittently open to marine waters and do not occur in the fluvial deposits. The authors conclude that acritarchs can be used by sedimentary geologists to delineate marine strata.

SMITH, ROBERT C., II

1. Tscheffkinite, a mineral new to Pennsylvania, *in* Montgomery, Arthur, Pennsylvania minerals (96): Keystone Newsletter, v. 19, no. 12, p. 9, **1970.** Tscheffkinite (chevkinite), a scarce rare-earth titano-silicate, is described.
2. (and Rose, A. W.). The occurrence and chemical composition of two distinct types of Triassic diabase in Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 7, p. 688, **1970.**
3. (and Herrick, D. C., Rose, A. W., and McNeal, J. M.). Zinc-lead occurrences near Mapleton, Huntingdon Co., Pennsylvania: Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 83, 37 p., illus., **1971.** This previously undescribed mineralized zone was located by geochemical prospecting techniques. Lead, zinc, silver, mercury, nickel, cobalt, and arsenic occur in anomalous concentrations in many stream sediments and soils along the zone.
4. Doughty mine, Sunbury, Pa.: Pennsylvania Geology, v. 3, no. 5, p. 10–11, illus., **1972.** Eight hundred fifty feet of the mine was mapped. Minerals present include galena, hemimorphite, cerussite, anglesite, hydrozincite, calcite, and dolomite. It is unsafe for mineral collectors.
5. (and Rose, A. W., Jr.). Major and trace elements in differentiates of Triassic diabase and their relationship to Cornwall-type magnetite ores [abs.]: Economic Geology, v. 67, no. 7, p. 1011, **1972;** [abs.], Geological Society of America Abstracts with Programs, v. 4, no. 7, p. 671, **1972.**
6. Cacti in Pike County: Pennsylvania Geology, v. 4, no. 5, p. 15, illus., **1973.** The author was unable to locate I. C. White's reported occurrence of lead, zinc, and copper in Hamilton Group sandstones in a 600-foot-high cliff between Matamoras and Milford, but did locate the cacti that White reported on the cliff. The cacti were identified as *Opuntia compressa* (Salisb.) Macbr. *(O. vulgaris).*
7. Coffinite from Jim Thorpe, Carbon County, Pa., *in* Montgomery, Arthur, Pennsylvania minerals (125): Keystone Newsletter, v. 22, no. 5, p. 9–10, **1973.** Report on coffinite, a mineral new to Pennsylvania.
8. Geochemistry of Triassic diabase from southeastern Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1973;** [abs.], Dissertation Abstracts International, v. 34, no. 9, p. 4433B–4434B, **1974.**
9. The old Woodbury zinc-lead occurrence, Bedford County comes to light: Pennsylvania Geology, v. 4, no. 2, p. 15–16, **1973.** A historical account of the zinc-lead occurrence.
10. The Woodberry zinc-lead occurrence, Bedford County: Pennsylvania Geology, v. 4, no. 5, p. 4–6, illus., **1973.** Geochemical prospecting techniques were used to examine the zinc-lead occurrence and determine where further exploration should take place.
11. (and Way, J. H., Jr.). Multi-colored fluorite at New Paris: Pennsylvania Geology, v. 4, no. 6, p. 16, **1973.** Description of fluorite collected from a quarry in Bedford County.
12. Fetid barite from Berks County, Pennsylvania: Pennsylvania Geology, v. 5, no. 6, p. 4–7, illus., **1974.** Several tons of fetid barite nodules were found scattered in fields in Berks County. This recent discovery, as well as older locations, is reviewed.
13. Interesting minerals from Pennsylvania's zinc-lead occurrences: Pennsylvania Geology, v. 5, no. 3, p. 8–9, **1974.** Accessory minerals found associated with zinc and lead are discussed. They include acanthite, albite, descloizite-mottramite, enargite, jordanite, mimetite-pyromorphite, native sulfur, posnjakite, pseudomalachite, and tennantite. Locations are given for each.

14. Uranium in the Hardyston Formation: Pennsylvania Geology, v. 5, no. 3, p. 11–12, **1974.** Indecisive studies led the author to conclude that a modern, instrumental study of the uranium content of the Hardyston should be undertaken.
15. New molybdenite occurrence in Berks County: Pennsylvania Geology, v. 6, no. 6, p. 16, **1975.** A roadcut in Berks County unearthed a new molybdenite occurrence. The occurrence is not of economic size, but identifies the general area as one that may be mineralized with other important metallic elements.
16. New uranium-thorium occurrence in Northampton County: Pennsylvania Geology, v. 6, no. 6, p. 11, **1975.** Uranium and thorium minerals were found to be common in an abandoned serpentine-talc quarry near Bushkill Gap.
17. (and Rose, A. W., and Lanning, R. M.). Geology and geochemistry of Triassic diabase in Pennsylvania: Geological Society of America Bulletin, v. 86, no. 7, p. 943–955, illus., **1975.** Recent studies of chemistry and field relationships revealed that the Triassic diabase belongs to three or more very distinct populations. This paper contains a summary of detailed studies in Pennsylvania on the field relationships, chemistry, and mineralogy of these types, a comparison of these diabases to other types of basaltic magmas, and a discussion of the origin of the magmas.
18. Mystery prospects, Berks County: Pennsylvania Geology, v. 8, no. 3, p. 15–16, illus., **1977.** Arsenic mineral deposits occurring at Huff's Church, Hereford Township, Berks County, are reviewed. An iron-rich safflorite is described.
19. Triassic diabase, *in* Root, S. I., Geology and mineral resources of the Harrisburg West area, Cumberland and York Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 148ab, p. 30–32, **1977.** The western third of the York Haven diabase sheet is exposed in the mapped area, and two dikes of Rossville-type diabase occur in the area. The composition, petrography, and economic and land use implications of the diabase are discussed briefly.
20. Zimmerman uranium prospect, Carbon County: Pennsylvania Geology, v. 8, no. 6, p. 10–12, illus., **1977.** Because of renewed interest in uranium, this Carbon County site was located and sampled. A location map is included.
21. Zinc and lead occurrences in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 72, 318 p., illus., **1977.** A field and literature review of all known zinc and lead occurrences in Pennsylvania, including an assessment of their economic potential. The investigation covers 47 occurrences in 19 counties, and several of the occurrences have not previously been reported.
22. (and Hoff, D. T.). Newly discovered minerals at Stone Jug copper prospect, Adams County: Pennsylvania Geology, v. 8, no. 5, p. 14–16, illus., **1977.** Common bornite and malachite, and minor to trace amounts of chalcocite, djurleite, chalcopyrite, molybdenite, powellite, azurite, and chrysocolla were found.
23. The mineralogy of Pennsylvania, 1966–1975: Friends of Mineralogy, Pennsylvania Chapter, Special Publication 1, 304 p., illus., **1978.** Sixty-two mineral species were verified as "new" to Pennsylvania, and their occurrences are described. Sketches, photographs, and location maps are included.
24. (and Barnes, J. H.). How many minerals in Pennsylvania: Pennsylvania Geology, v. 10, no. 1, p. 8–10, **1979.** Pennsylvania is estimated to have about 500 minerals. A list is included.

See also Geyer, Alan R., 11; Lapham, Davis M., 16; Rose, Arthur W., 9; Sevon, William D., 16.

SMITH, TIMOTHY E.

1. (and Noltimier, H. C.). Paleomagnetism of the Newark trend igneous rocks of the north central Appalachians and the opening of the Central Atlantic Ocean: American Journal of Science, v. 279, no. 7, p. 778–807, illus., **1979.** Although

this study centers on paleomagnetic results from 28 sites in Connecticut, igneous rock data obtained from central Pennsylvania are included.

SMOSNA, R., *see* Patchen, D. G., 1.

SMYTH, PAULINE

1. Fusulinids in the Appalachian basin: Journal of Paleontology, v. 48, no. 4, p. 856–859, illus., **1974.** The fusulinid zones discussed include the Pottsville, Allegheny, and Conemaugh Groups of Pennsylvanian age. Most localities are in Ohio but a few are in western Pennsylvania.

SNELL, DAVID E.

1. Big, big concretions: Pennsylvania Geology, v. 1, no. 6, p. 6–7, illus., **1970.** Interesting aspects of concretions unearthed near Tyrone include the relative abundance of those in the 4-foot-diameter range, roundness as opposed to irregularly shaped masses, and the relatively clean parting that exists between the concretions and the enclosing shale.

SNELSON, SIGMUND

1. Subsurface data bearing or tectonic style of Valley and Ridge province [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 10, p. 2109, **1972.**
2. Seismic data bearing on the tectonic style of the Valley and Ridge province [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 272, **1976.**

SOCOLOW, ARTHUR A.

1. From the desk of the State Geologist...: Pennsylvania Geology, v. 1, no. 1, p. 1, **1969.** The role of the Pennsylvania Geological Survey is discussed.
2. From the desk of the State Geologist...: Pennsylvania Geology, v. 1, no. 2, p. 1, **1969.** Geologic findings on the moon help to point out the need to get on with geologic studies and problem solving on earth.
3. From the desk of the State Geologist...: Pennsylvania Geology, v. 1, no. 3, p. 1, **1969.** As part of a nation whose economy is largely based on mineral resources, Pennsylvania has a major role to play as one of the leading mineral-producing states.
4. Every day is Earth Day for geologists: Pennsylvania Geology, v. 1, no. 6, p. 1, **1970.** By definition, geologists are environmentalists. We welcome the public recognition of environmental problems and offer our continued research and expertise for problem solving.
5. Geologic research—A need for relevance: Pennsylvania Geology, v. 1, no. 7, p. 1, **1970.** Geologic research can and should be addressed to the problems and needs of mankind.
6. Geology—a planning tool: Pennsylvania Geology, v. 1, no. 4, p. 1, **1970.** Geology and mineral resources have been major controlling factors of man's history. Geology is an essential planning tool and should be thorough and accurate; most important, it should be used.
7. Geology for all!: Pennsylvania Geology, v. 1, no. 8, p. 1, **1970.** The use of geology is not limited to scientists or professionals. All segments of the public and industry can and do utilize various aspects of geology.
8. Metropolitan environmental studies: Pennsylvania Geology, v. 1, no. 9, p. 1, **1970.** In the compressed and complex environment of urban areas, there is a particular need to understand the geologic conditions by the planners and decision makers.

9. Pennsylvania: State Geologists Journal, v. 22, no. 1, p. 20, **1970;** v. 22, no. 2, p. 24–25, **1970;** v. 23, no. 1, p. 17, **1971;** v. 24, p. 45–46, **1972;** v. 25, p. 44–46, **1973;** v. 26, p. 42–43, **1974;** v. 27, p. 43–45, **1975;** v. 28, p. 49–51, **1976;** v. 29, p. 48–50, **1977;** v. 30, p. 70–72, **1978;** v. 31, p. 60–62, **1979.** Each year the basic programs of geologic mapping, mineral-resource studies, groundwater investigations, and topographic mapping are summarized. Completed studies, on-going projects, and new projects are discussed briefly.
10. There's water in our future: Pennsylvania Geology, v. 1, no. 5, p. 1, **1970.** Considering the extent and importance of our groundwater resources, it is essential that we get on with a systematic inventory and evaluation of these resources.
11. Bradford field, symbol of research done, and waiting to be done: Pennsylvania Geology, v. 2, no. 4, p. 1, **1971.** On the occasion of the centennial of the Bradford oil field discovery, recognition is given to the important role of geologic investigations and research.
12. Elsie Adams—a success story: Pennsylvania Geology, v. 2, no. 3, p. 1, **1971.** A tribute to the important role and contributions of the Pennsylvania Survey's Executive Secretary, Elsie Adams, in the year of her retirement.
13. Meeting the challenge: Pennsylvania Geology, v. 2, no. 6, p. 1, **1971.** There is a growing recognition among geologists that they have both a challenge and a responsibility to address the environmental problems that our society faces, and to provide accurate and intelligible data and recommendations.
14. Putting together is harder than taking apart: Pennsylvania Geology, v. 2, no. 2, p. 1, **1971.** In a world where the scientific process involves taking things (or subjects) apart to analyze the details, the greatest challenge is to understand how the details relate to each other and work together. This is equally true with geological and environmental processes.
15. The Pennsylvania Survey joins new department: Pennsylvania Geology, v. 2, no. 1, p. 1, **1971.** The role of the Pennsylvania Survey in the newly created Department of Environmental Resources is discussed.
16. We can have our cake and eat it too: Pennsylvania Geology, v. 2, no. 5, p. 1, **1971.** Environmentally responsible mining practices need not prevent us from continuing to be a major mineral-producing state.
17. Agnes devastates Pennsylvania Survey: Pennsylvania Geology, v. 3, no. 4, p. 1–2, **1972.** A blow-by-blow account of how the Agnes flood in Harrisburg wiped out the Survey quarters.
18. Agnes floods out Pennsylvania Survey: Geotimes, v. 17, no. 9, p. 22–23, illus., **1972.** The nearly complete physical destruction of the Survey is summarized through photographs and narrative.
19. From the desk of the State Geologist...: Pennsylvania Geology, v. 3, no. 3, p. 1, **1972.** The Pennsylvania Survey struggles to continue operations in the aftermath of the Agnes flood disaster.
20. Geology can save you heartache: Pennsylvania Geology, v. 3, no. 2, p. 1, **1972.** An example of a housing development that has had frequently flooded basements illustrates the fact that a thorough knowledge of geologic conditions can prevent many tragedies.
21. More than limited involvement: Pennsylvania Geology, v. 3, no. 1, p. 1, **1972.** The public is becoming aware that geologists deal with more than mineral deposits. They are also involved with waste disposal, power plant siting, transportation corridors, water resources, tunnelling conditions, recreation facilities, and building construction conditions.

22. Our library needs: Pennsylvania Geology, v. 3, no. 5, p. 1, **1972.** A plea and an enumeration of the needs of the Pennsylvania Survey library which was totally destroyed in the Agnes flood of June 1972.
23. The lessons of Agnes: Pennsylvania Geology, v. 3, no. 6, p. 1, **1972.** A discussion of the practical lessons taught by Hurricane Agnes, with a hope that we all learned the lessons.
24. Geology and the energy crisis: Pennsylvania Geology, v. 4, no. 2, p. 1, **1973.** The energy crisis brought on by the mid-East oil embargo calls for a particularly prompt and careful response by the geological profession. It is a challenge which can and must be met.
25. Holes in the ground—hidden assets: Pennsylvania Geology, v. 4, no. 1, p. 1, **1973.** Potential uses for mined-out areas are varied and they offer considerable economic potential. Many examples are already in operation.
26. Our other mineral resources are also scarce: Pennsylvania Geology, v. 4, no. 3, p. 1, **1973.** Even as we face an energy crisis, we must recognize that this nation is highly dependent on foreign sources for a large number of strategic minerals. We must deal with this problem while there is still time to take corrective action.
27. Pennsylvania, we've got you covered: Pennsylvania Geology, v. 4, no. 5, p. 1, 12, **1973.** On the occasion of completion of topographic map coverage of Pennsylvania, the evolution and future plans of the topographic mapping program are discussed.
28. The crisis that came to stay: Pennsylvania Geology, v. 4, no. 6, p. 1, **1973.** The energy crisis cannot be solved quickly or by any single procedure. Many supplementary energy resources will need to be stimulated, as well as conservation.
29. There's an EIS in our life—and yours: Pennsylvania Geology, v. 4, no. 4, p. 1, **1973.** Environmental Impact Statements have become a regular part of project planning and design. Geologists of the Pennsylvania Geological Survey have an important role to play.
30. From the desk of the State Geologist...: Pennsylvania Geology, v. 5, no. 3, p. 1, **1974.** The collection of basic geologic data, which commonly takes years, eventually results in practical applications and helps to solve real problems. The need is to systematically conduct geological investigations and assemble the data so it is ready when the need arises.
31. Geologic interpretation of aeromagnetic maps of southeastern Pennsylvania: Pennsylvania Geological Survey, 4th ser., Information Circular 77, 85 p., illus., **1974.** A combined edition of previously published Pennsylvania Geological Survey Information Circulars 18 through 35, 37 through 42, and 44 through 46. The locations and probable geologic causes of magnetic anomalies that appear on published aeromagnetic maps of Pennsylvania are discussed.
32. Geology goes underground: Pennsylvania Geology, v. 5, no. 4, p. 1, 30, **1974.** Tunnelling and underground excavations are increasingly being used for transportation, water movement, power generation, and industrial plant installations. Geology is an essential component of this process.
33. Managing our most valuable resource: Pennsylvania Geology, v. 5, no. 1, p. 1, 16, **1974.** Our most valuable resource, with reference to the fact that there is no substitute, is water. While past emphasis has been on protecting water quality, we must now recognize the need to manage water quantity.
34. They'll dig some up somewhere: Pennsylvania Geology, v. 5, no. 5, p. 1, **1974.** Even as our nation and the world need more and more mineral resources, many areas are for various reasons being designated off limits to mineral exploration. If this continues, where are we going to find the mineral raw materials upon which our civilization is based?

35. We're putting the county on the map: Pennsylvania Geology, v. 5, no. 6, p. 1, **1974.** Introducing the newly instituted program of preparing county topographic maps in Pennsylvania.
36. Would you rather own a diamond mine or a gravel pit?: Pennsylvania Geology, v. 5, no. 2, p. 1, **1974.** The value of the low-unit-priced industrial minerals (such as gravel) is greater in Pennsylvania than the value of all exotic minerals (of which we have essentially none).
37. A great Commonwealth mineral deposit: Pennsylvania Geology, v. 6, no. 3, p. 1, **1975.** A description of one of the world's great under-utilized mineral deposits, the anthracite of northeastern Pennsylvania. The large, recoverable reserves wait to be developed.
38. A man's best friend: Pennsylvania Geology, v. 6, no. 6, p. 1, **1975.** A discussion of the esthetics and pleasures of mineral collecting.
39. And then came Eloise: Pennsylvania Geology, v. 6, no. 6, p. 6-9, illus., **1975.** A largely pictorial review of the September 1975 flood of the Susquehanna River.
40. Learning to live with nature's vagaries: Pennsylvania Geology, v. 6, no. 5, p. 1, **1975.** The author points out a variety of geologic hazards in Pennsylvania, such as landslides and sinkholes, and discusses the need to identify, map, and plan.
41. Our stake in the Atlantic: Pennsylvania Geology, v. 6, no. 1, p. 1, **1975.** Discussion of the direct and indirect benefits for Pennsylvania of potential oil and gas production from the Atlantic continental shelf.
42. The Survey has a new home: Pennsylvania Geology, v. 6, no. 2, p. 1, **1975.** A description of the Pennsylvania Survey's new office, laboratory, and library facilities in the Executive House, Harrisburg.
43. Why Pennsylvania for uranium prospecting: Pennsylvania Geology, v. 6, no. 4, p. 1, **1975.** An explanation of the surge of prospecting for uranium in Pennsylvania. A large number of known small prospects, new theories and techniques of prospecting, and the rising price for uranium ore have all been stimulants.
44. Is anybody listening?: Pennsylvania Geology, v. 7, no. 6, p. 1, **1976.** Geologists have issued warnings and predictions that have commonly gone unheeded. Those include earthquake and landslide warnings and predictions of oil shortages. In Pennsylvania we have predicted floods and sinkhole problems. The author questions whether the planners and decision makers are listening.
45. Lead and zinc, much in the past, more in the future: Pennsylvania Geology, v. 7, no. 4, p. 1, 32, **1976.** Pennsylvania has a long history of lead and zinc production, and scores of recorded mine sites. Although only one zinc mine operates now, it is a large one; comparable geologic conditions and numerous prospects offer hope for new developments.
46. Memorial of Davis M. Lapham—May 5, 1931-December 20, 1974: American Mineralogist, v. 61, no. 5-6, p. 528-530, portrait, **1976.** A memorial to the distinguished scientist who for many years was the Chief of the Mineral Resources Division at the Pennsylvania Geological Survey.
47. Our chrome-yellow heritage: Pennsylvania Geology, v. 7, no. 3, p. 1, **1976.** A description of the world ranking of chromium ore production that Pennsylvania held in the late 1800's.
48. Our geologic heritage: Pennsylvania Geology, v. 7, no. 1, p. 1, **1976.** On the occasion of the nation's bicentennial, it is worth noting the tremendous impact that Pennsylvania's geology and mineral resources have had on our development and our industry.
49. Pennsylvania's iron age: Pennsylvania Geology, v. 7, no. 2, p. 1, 9, **1976.** A description of the long history of iron ore mining in Pennsylvania, involving hundreds of small mines and smelters throughout the state.

50. What if: Pennsylvania Geology, v. 7, no. 5, p. 1, **1976.** Restricted access for mineral prospecting on private as well as public lands in the East threatens our future supply of essential mineral raw materials. If such restrictions had existed in our past history, we would not be the great nation we now are.
51. Labels are created by man: Pennsylvania Geology, v. 8, no. 3, p. 1, 7, **1977.** There are no good or bad mineral resources; it is the way that man utilizes them that makes the difference. Uranium resources are not evil of their own doing.
52. Lead time—rhymes with need time: Pennsylvania Geology, v. 8, no. 5, p. 1, 16, **1977.** Whatever solution one favors in the energy crisis, many years are needed to bring about its accomplishment. This includes new coal mines, new power plants, new oil fields, and new refineries.
53. Mineral economics—A tale of two commodities: Pennsylvania Geology, v. 8, no. 6, p. 1, **1977.** In one instance, the poor economics of the steel industry has resulted in the closing of the Grace mine at Morgantown. On the other hand, favorable natural gas prices have resulted in a dramatic increase of well drilling and gas production.
54. Not yet, not yet: Pennsylvania Geology, v. 8, no. 2, p. 1, **1977.** A critical comment on the numerous regulatory and environmental constraints on the development of outer continental shelf oil and gas resources.
55. Thank you Bill Lytle for a job well done: Pennsylvania Geology, v. 8, no. 4, p. 1, 28, **1977.** An expression of thanks for the accomplishments of William Lytle, retiring chief of the Division of Oil and Gas Geology at the Pennsylvania Geological Survey.
56. The many faces of geology: Pennsylvania Geology, v. 8, no. 1, p. 1, **1977.** A discussion of the many facets of geology as well as the numerous applications of geology to a great variety of problems and needs of man.
57. Competition—for worse or better: Pennsylvania Geology, v. 9, no. 3, p. 1, 11, **1978.** Suburban expansion, agricultural needs, recreational facilities, and mineral development are all in competition for land use. A sound procedure is needed to establish priorities, giving consideration to multiple land use and the highest order of land use.
58. Energy progress: Pennsylvania Geology, v. 9, no. 2, p. 1, **1978.** In response to the energy crisis that was initiated in 1977, Pennsylvania has progressed with increased drilling for oil and gas and plans for several major new coal mines, and has made major progress towards completing several new nuclear power plants.
59. Groundwater comes of age: Pennsylvania Geology, v. 9, no. 4, p. 1, **1978.** The public, state government, and federal government have begun to give proper recognition to the importance of groundwater. Systematic data collection and management plans are being implemented.
60. Is reaction to crisis the only way?: Pennsylvania Geology, v. 9, no. 6, p. 1, **1978.** The world, the nation, and the state are still difficult to persuade to take action in a timely fashion to permit effective planning and to avoid impending crises. We still tend to respond primarily to crises as they arise.
61. Minerals—keystones of our economy: Pennsylvania Geology, v. 9, no. 1, p. 1, **1978.** The annual value of minerals produced in Pennsylvania exceeds three billion dollars, and the industry directly employs over 50,000 persons. These raw materials are the basis for a huge multibillion dollar industrial economy in the state.
62. Pennsylvania, *in* Oil and gas activity reports of states and official observers for 1977: Oil and Gas Compact Bulletin, v. 37, no. 1, p. 42, **1978.** Drilling and exploration were up from 1976. Oil production and reserves decreased and gas production and reserves increased.

63. Why not support the basics?: Pennsylvania Geology, v. 9, no. 5, p. 1, **1978.** It is relatively easy to get federal funding for exotic research projects, but it is practically impossible to get help to collect basic data which are needed to make effective decisions.
64. A new challenge: Pennsylvania Geology, v. 10, no. 3, p. 1, **1979.** The transfer of the Oil and Gas Regulatory Division to the Pennsylvania Survey creates a regulatory function for the first time, and a new challenge.
65. Coal is our goal: Pennsylvania Geology, v. 10, no. 6, p. 1, **1979.** Pennsylvania's large, available reserves of anthracite and bituminous coal offer our best hope for developing greater energy self-sufficiency in Pennsylvania.
66. Our coal: problems and hope: Pennsylvania Geology, v. 10, no. 5, p. 1, 13, **1979.** For a variety of economic, technical, and political reasons, the much-hoped-for expansion of coal production has not materialized. Awareness, however, is the first step to solution of the problems.
67. Pennsylvania anthracite—a major energy resource, *in* Hill, R. F., ed., Energy technology VI—"Achievements in Perspective": Energy Technology Conference, 6th, Washington, D. C., 1979, Proceedings, p. 527–529, **1979.** Eight billion tons of recoverable low-sulfur anthracite awaits the initiative of industry and government to develop adequate markets, improved technology, modernized shipping facilities, and coordinated mining leadership. This major energy resource in our own "backyard" can go a long way to provide energy self-sufficiency in the United States.
68. The lessons we learn: Pennsylvania Geology, v. 10, no. 2, p. 1, **1979.** The Three Mile Island crisis, as well as the 1972 flood, demonstrated that there is a need to have on hand completed groundwater studies, geologic maps, and topographic maps. It is too late after the emergency arises.
69. The numbers game: Pennsylvania Geology, v. 10, no. 1, p. 1, **1979.** The stress upon quantification, such as cost-benefit ratios, results in a loss of human, esthetic, and cultural values. We should resist this trend of "slavery" to computers and numbers.
70. Wanted: solutions: Pennsylvania Geology, v. 10, no. 4, p. 1, **1979.** People are quick and ready to point out problems, needs, and opposition. What is needed are solutions and constructive suggestions.

See also Geyer, Alan R., 15; Kebblish, William, 3, 5.

SOHN, ISRAEL G.

1. Dunkard Ostracoda—an evaluation, *in* Barlow, J. A., and Burkhammer, Susan, eds., Proceedings of the First I. C. White Memorial Symposium [Morgantown, W. Va., 1972]—"The Age of the Dunkard": West Virginia Geological and Economic Survey, p. 265–280, illus., **1975.** A review of published studies of Pennsylvanian and Permian freshwater ostracodes showed that much more research is necessary to determine their stratigraphic utility in resolving the problem of the age of the Dunkard Group.

SOLEM, ALAN

1. (and Yochelson, E. L.). North American Paleozoic land snails, with a summary of other Paleozoic nonmarine snails: U.S. Geological Survey Professional Paper 1072, 42 p., illus., **1979.** A redescription and review of Pennsylvanian and Early Permian terrestrial forms demonstrating the early diversification of the Pulmonata. A discussion of gastropods from the rocks of the Dunkard basin of southwestern Pennsylvania is included in the report.

SOPPER, WILLIAM E.

1. (and Hiemstra, L. A. V.). Effects of simulated cloud seeding on streamflow of selected watersheds in Pennsylvania: Water Resources Bulletin, v. 6, no. 5, p. 754–766, illus., **1970.** A mathematical model was developed to simulate the hydrologic behavior of five small watersheds in central Pennsylvania. The study indicates that on a theoretical basis, cloud seeding would be a feasible method of augmenting low streamflow during the summer months in watersheds in the northern Appalachian region.

SOREN, JULIAN

1. The Port Jervis thrust fault, tri-states area, New York, New Jersey, and Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 36–37, **1970.**

SOSSONG, A. T.

1. Subsidence experience of Bethlehem Mines Corporation in central Pennsylvania, *in* Hargraves, A. J., ed., Subsidence in mines: Symposium on Subsidence in Mines, 4th, Wollongong, N. S. W., Australia, 1973, Australasian Institute of Mining and Metallurgy, Illawarra Branch, Proceedings, p. 5.1–5.5, **1973.** A brief discussion of the subsidence and groundwater problems encountered in Cambria County with the introduction of longwall mining methods in 1965.

SOUTHWICK, DAVID L.

1. Structure and petrology of the Harford County part of the Baltimore-State Line gabbro-peridotite complex, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 397–415, illus., **1970.** Brings together information from Lancaster County, Pennsylvania, and the Baltimore area in studying the Harford County, Maryland, portion of this small but important complex, and in examining controversies on the origin of the entire complex.

SPACKMAN, W.

1. (and Davis, A., and Walker, P. L., Jr.). The use of Pennsylvania coals in low Btu gasification processes—a preliminary study: Pennsylvania State University, College of Earth and Mineral Sciences Special Research Report SR–112, 100 p., illus., **1976.** A schematic design of an experimental coal gasification facility is presented, and the basic composition of representative Pennsylvania coals is discussed. Page-sized maps are included showing sulfur, copper, tin, nickel, vanadium, and moisture content of major coal seams and coal-bearing formations.

SPALL, HENRY

1. Predicting rock bursts in mines: Earthquake Information Bulletin, v. 11, no. 3, p. 89–94, illus., **1979.** Experiments by the U.S. Bureau of Mines show that rock noise (seismicity) reaches a maximum and then abruptly decreases prior to roof failure. Using the method, predictions can be made of where such failure will occur. The theory holds promise for the prediction of earthquakes.

SPEECE, JACK H.

1. (and Cullinan, Mike, compilers and editors). The caves of Blair County, Pennsylvania: National Speleological Society, Mid-Appalachian Region, Bulletin 8, 90 p., illus., **1972.** Ninety-one caves are listed and described. Locations are given by latitude, longitude, and elevation on 7½-minute topographic maps. Some cave maps are included.

2. Dragon Cave; America's oldest cave reference (Berks County, Pa.): Journal of Spelean History, v. 13, no. 1–2, p. 4–5, **1979** [not seen].

See also Cullinan, Michael, 1.

SPEER, J. ALEXANDER

1. (and Martin, E. C.). Pennsylvania minerals: I, Violarite from the Gap nickel mine [Lancaster County]: Mineralogical Record, v. 5, no. 5, p. 209–210, illus., **1974.** The violarite occurs as polycrystalline veins following boundaries between other ore minerals.
2. Pennsylvania minerals: II, strontianite: Mineralogical Record, v. 7, no. 2, p. 69–71, **1976.** Strontianite occurs in vugs and solution channels as white, spherical groups and coatings of minute, acicular crystals. New localities for Pennsylvania include Winfield quarry, Union County; "Old" Jersey Shore Borough quarry and Lime Bluff quarry, Lycoming County; Roaring Spring, Blair County; New Paris, Bedford County; Blue Ball, Lancaster County; Allenport, Huntingdon County; and Herndon, Northumberland County.
3. (and Hensley-Dunn, M. L.). Strontianite composition and physical properties: American Mineralogist, v. 61, no. 9–10, p. 1001–1004, illus., **1976.** Strontianite from Winfield, Union County, is $Sr_{0.815}Ca_{0.812}CO_3$, containing 0.05 percent PbO and 0.31 percent BaO, by microprobe. Indirect determination is possible from the d_{132} diffraction peak. Data are included for 11 non-Pennsylvania samples and reagent $SrCO_3$.
4. Pennsylvania minerals: III, uvarovite: Keystone Newsletter, v. 26, no. 2, p. 7–10, illus., **1977.** Plotted on a uvarovite-grossular-andradite diagram, two specimens from Wood's chrome mine, Lancaster County, fall on the uvarovite-grossular join, one being 72 to 79 percent uvarovite, the other 11 percent uvarovite (hence chromian grossular).
5. (and Craig, J. R., and Hill, R. J.). The "cobaltite" crystals from the Kibblehouse quarry [Montgomery County]: Rocks and Minerals, v. 53, no. 3, p. 130–134, illus., **1978.** The geology of the quarry is reviewed and the composition of the cobaltite crystals discussed.
6. Pennsylvania minerals IV: Mackinawite from the Gap nickel mine, Lancaster Co.: Keystone Newsletter, v. 28, no. 5, p. 3–5, illus., **1979.** The mackinawite occurs as silver-gray filaments up to 0.5 mm long in a chalcopyrite vein in amphibolite, and is probably an exsolution product. Includes electron microprobe analyses.

SPILLER, REGINALD W.

1. Univariate and multivariate analysis of water well yields as related to fracture traces and lineaments in the Martinsburg Shale in eastern Pennsylvania: University Park, Pennsylvania State University, Master's thesis, **1979.**

SPOLJARIC, NENAD

1. Possible new major faults in the Piedmont of northern Delaware and southeastern Pennsylvania and their relationship to recent earthquakes: Southeastern Geology, v. 16, no. 1, p. 31–39, illus., **1974.** By studying ERTS-1 imagery, stream characteristics, foliation, and aeromagnetic data, it was concluded that recent earthquakes did not cause significant surface deformations.

SPONSELLER, ROBERT D.

1. Analyses and measured sections of Pennsylvania bituminous coals: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 66, 23 p., unpaginated data sheets, illus., **1973.** Includes detailed data on the lithology, thickness, and other

physical characteristics of the bituminous coals of western Pennsylvania and stratigraphically adjacent units. Also includes proximate analyses, sulfur content, and Btu determinations for selected coals.

SPRINGER, DALE A.

1. Pleistocene terraces of the West Branch of the Susquehanna River near Lewisburg, Pennsylvania: Easton, Pa., Lafayette College, Senior thesis, **1973.**

SQUIRE, ANNE, *see* Parris, Martha, 1.

STALEY, LARRY R.

1. Soil survey of Northampton County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 120 p., illus. including soils maps, **1974.** Includes detailed descriptions and maps of the soils, as well as sections on use and management, and formation and classification of the soils.

STANTON, RONALD W., *see* Cecil, C. Blaine, 1; Finkelman, Robert B., 5, 6, 7; Minkin, Jean A., 1.

STAUB, JAMES R., *see* Ferm, John C., 6, 7; Pedlow, George W., III, 2.

STEACY, R. E.

1. Water loss from Jordan Creek near Allentown, Pennsylvania—1973 to 1976: U.S. Geological Survey Open-File Report 77-479, 26 p., illus., **1977** [not seen].

STEBLAY, B. J., *see* Leighton, F. W., 1.

STEFANKO, ROBERT

1. Subsurface disposal of mine water: Society of Mining Engineers of AIME Transactions, v. 247, p. 54-60, illus., **1970.** With passage of the Clean Streams Act in Pennsylvania and its impact on the coal industry, considerable research has been conducted to explore various approaches to the problem of disposal of liquid industrial wastes, including deep-well disposal. The author discusses many problems associated with an experimental well drilled for subsurface disposal, and assesses the potential for deep-well disposal of mine water.
2. (and Choi, D. S.). Anchorage performance in rock bolting: Society of Mining Engineers of AIME Transactions, v. 247, p. 88-92, illus., **1970.** The effectiveness of anchorage to maintain tension in rock bolts was tested in an anthracite mine in eastern Pennsylvania. Performance is reviewed for wedge, expansion shell, and resin anchorage.
3. (and Venkataramani, R.). Crisis in the coal mining industry: Earth and Mineral Sciences, v. 39, no. 8, p. 65-67, 72, **1970.** The bleak manpower situation in the bituminous coal industry, along with health and safety concerns, is reviewed.
4. (and Watkins, E. H.). Monorail haulage system: Mining Congress Journal, v. 56, no. 6, p. 45-49, illus., **1970.** A monorail system in a low-tonnage Pennsylvania anthracite mine is described as being relatively inexpensive to install and operate. No location is given.

See also Frantz, Robert L., 1.

STEIDL, PETER F.

1. Geology and methane content of the Upper Freeport coalbed in Fayette County, Pa.: U.S. Bureau of Mines Report of Investigations 8226r, 17 p., illus., **1977;** reprinted *in* Root, S. I., compiler, Geologic conditions affecting safe bituminous coal mining in Pennsylvania: selected papers: Pennsylvania Geological Survey,

4th ser., Information Circular 84, p. 94–112, illus., **1979.** Coal and overburden isopachs, structure and joint-pattern maps, and a fence diagram were prepared using data from gas and oil exploration logs and coal outcrops.

2. Foam stimulation to enhance production from degasification wells in the Pittsburgh coalbed: U.S. Bureau of Mines Report of Investigations 8286, 10 p., illus., **1978.** Seven experimental degasification wells were drilled near Waynesburg, Greene County, as part of a project designed to decrease the hazard of methane, allow increased production by reducing "down" time, and lower ventilating costs.
3. Geology and methane resources of the Upper Freeport coalbed (Middle Pennsylvanian) in Fayette County, Pa. [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 87, **1978.**
4. (and Lambert, S. W.). Foam stimulation for enhanced recovery from coal-gas wells [abs.]: American Association of Petroleum Geologists Bulletin, v. 62, no. 3, p. 564–565, **1978.**

STEPHENS, C., *see* Jordan, R. R., 2.

STEPHENS, GEORGE C.

1. (and Wright, T. O.). Spitzenberg Hill, Berks Co., Pa.: Triassic or Ordovician? [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 276–277, **1976.**
2. (and Colman, C. S.). Geophysical and geochemical exploration of the Gap nickel mine, Lancaster County, Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 53, no. 2, p. 209–211, illus., **1979.** Ground magnetic and very low frequency electromagnetic surveys were conducted over the east half of the amphibolite lens to test the geophysical response of a buried massive sulfide ore body and whether this combination of geophysical techniques could be used as an aid to bedrock mapping in areas of sparse outcrop.
3. (and Wright, T. O., Platt, L. B., and Wright, E. K.). Current knowledge of the Martinsburg Formation and the new Pennsylvania geologic map [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 54–55, **1979.**

See also Harms, Tekla A., 2; Platt, Lucian B., 1; Wright, Thomas O., 1, 4, 5, 8, 9, 10, 11.

STEPHENSON, DAVID C.

1. Paleoenvironment analysis of the Upper Silurian Callocystidae (Cystoidea, Rhombifera) in the central Appalachians: Philadelphia, Temple University, M.S. thesis, **1974.**

STEVENSON, D. L.

1. Sub-Trenton structure of Ohio, with views on isopach maps and stratigraphic sections as basis for structural myths in Ohio, Illinois, New York, Pennsylvania, West Virginia, and Michigan: discussion: American Association of Petroleum Geologists Bulletin, v. 59, no. 8, p. 1503–1505, illus., **1975.**

STEWART, NANNA B.

1. Detailed petrography—an aid in the evaluation of gravel aggregates for freeze-thaw resistance, *in* Hoover, K. V., ed., Proceedings, Fifth Forum on Geology of Industrial Minerals [Harrisburg, Pa., 1969]: Pennsylvania Geological Survey, 4th ser., Mineral Resource Report 64, p. 55–89, illus., **1970.** Seven gravels from sites in northern and central Pennsylvania were studied petrographically to determine their response to conditions of freezing and thawing, for potential use as aggregate in concrete. Results are indicated along with recommendations for further research.

STINGELIN, RONALD W.

1. Airborne infrared imagery and its limitations in civil engineering practice: Highway Research Record, no. 421, p. 14–21, illus., **1972** [not seen].
2. (and Baker, E. T., and Cousin, S. B.). Overview of subsidence potential in Pennsylvania coal fields: Appalachian Regional Commission Report ARC-73-111-2552, 159 p., illus., **1975.** The purpose of the study was to develop a methodology that would permit the classification of land areas in the anthracite region in terms of their potential for mine subsidence. A subsidence data base was developed, and computer maps were generated showing three categories of subsidence potential.

STOLAR, JOHN, JR.

1. Megaspores and Devonian-Mississippian boundary along Route 322, Centre County, Pennsylvania: University Park, Pennsylvania State University, D.Ed. thesis, **1978;** [abs.], Dissertation Abstracts International, v. 39, no. 2, p. 623B, **1978.**

STONE, A. W., *see* Claypool, G. E., 1.

STORCK, P. L., *see* Donahue, Jack D., 7.

STOYER, C. H., *see* Greenfield, R. J., 1.

STREEL, MAURICE

1. (and Traverse, Alfred). Spores from the Devonian-Mississippian transition in the Horseshoe Curve section near Altoona, Pennsylvania [abs.]: Palynology, v. 2, p. 233, **1978.**
2. (and Traverse, Alfred). Spores from the Devonian/Mississippian transition near the Horseshoe Curve section, Altoona, Pennsylvania, U.S.A.: Review of Palaeobotany and Palynology, v. 26, no. 4, p. 21–39, illus., **1978.** The shaly beds near the Horseshoe Curve contain two major assemblages of spores. The identification of the spores placed the units in the Devonian.

STREIB, DONALD L.

1. (and Renton, J. J., and Hidalgo, R. V.). Correlation between low-boiling soluble organic compounds and elemental geochemical analysis of the Pittsburgh coal [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 1, p. 47, **1972.**
2. (and Renton, J. J., and Hidalgo, R. V.). Organic acid content of some Upper Pennsylvania [sic] coals [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 5, p. 440, **1973.**
3. (and Renton, J. J., and Hidalgo, R. V.). Possible correlation of organic acid content of the Pittsburgh coal to the paleogeography of early Monomgahela [sic] time [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 5, p. 440–441, **1973.**

STROTHER, P. K.

1. (and Traverse, Alfred). Plant remains in Silurian rocks of Pennsylvania [abs.]: American Association of Stratigraphic Palynologists, Annual Meeting, 10th, Abstracts of Papers, p. 27, **1977;** Palynology, v. 3, p. 292, **1979.**
2. (and Traverse, Alfred). Early Silurian nonmarine palynoflorules from Poe Paddy, Pennsylvania [abs.]: American Association of Stratigraphic Palynologists, Annual Meeting, 12th, Abstracts of Papers, p. 27, **1979.**
3. (and Traverse, Alfred). Plant microfossils from Llandoverian and Wenlockian rocks of Pennsylvania: Palynology, v. 3, p. 1–21, illus., **1979** [not seen].

STRUTT, KIMBERLY B.

1. Geology of the Pequea silver mine area, Lancaster Co., Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1971.**

STUCKENRATH, R., JR., *see* Adovasio, J. M., 1, 2, 3; Crowl, George H., 5; Donahue, Jack D., 5, 6, 8, 9.

STUEBER, ALAN M., *see* Fisher, R. Stephen, 2, 3.

STURGEON, M. T., *see* Hoare, R. D., 1.

SUAREZ, DONALD L.

1. (and Langmuir, Donald). Trace elements in waters affected by landfills [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 7, p. 829, **1972.**
2. Heavy metals in waters and soil associated with several Pennsylvania landfills: University Park, Pennsylvania State University, Ph.D. thesis, **1974;** [abs.], Dissertation Abstracts International, v. 36, no. 3, p. 1098B, **1975.**
3. (and Langmuir, Donald). Heavy metal relations in soils: implications to waste disposal [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 7, p. 976-977, **1974.**
4. (and Langmuir, Donald). Heavy metal relationships in a Pennsylvania soil: Geochimica et Cosmochimica Acta, v. 40, no. 6, p. 589-598, illus., **1976.** The authors studied heavy metals in exchangeable and nonexchangeable form in cores from six holes up to 70 feet deep beneath a municipal-waste landfill in central Pennsylvania. Experimental procedures, soil-trace metal distribution, trace metal association with depth, and predictive heavy-metal relationships are discussed.

SUBITZKY, SEYMOUR

1. Heavy storm precipitation and related mass movement, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-641-D, **1975.** Various charts show tracks of extratropical storms that entered the Ohio River basin, locations of landslides, precipitation associated with various storms, and environmental characteristics of soils.
2. Hydrogeologic framework and generalized shallow ground-water circulation system, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-641-B, 2 sheets, **1975.** Various charts and tables indicate the distribution of folds, generalized diagrammatic groundwater circulation, and hydrologic properties of rock types.
3. Mining and related problems of the shallow hydrogeologic regime, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-641-C, **1975.** Charts depict problems associated with mining, including fractures, subsidence fissures, and transverse joints.
4. Some aspects of water quality as affected by land use in McLaughlin Run and Painters Run basins, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-641-E, **1975.** Various charts and tables show how mining and related problems and urban development affect water quality in small watersheds.
5. Summary of the hydrogeologic regime as related to environmental characteristics, Allegheny County, Pennsylvania: U.S. Geological Survey Miscellaneous Field Studies Map MF-641-A, **1975.** The chart shows geologic units, lithologic and structural characteristics, hydrologic characteristics, and environmental characteristics.

SUFFET, I. H., *see* Glaser, E. R., 1.

SUHR, NORMAN H., *see* Gong, Henry, 2; Rose, Arthur W., 6, 11.

SULLIVAN, C. D., *see* McCulloch, Charles M., 4.

SUMNER, JOHN R.

1. (and Rolke, C., Moren, A., and Zipf, K.). Interpretation of gravity observations over structures in the Reading Prong [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 225, **1973.**
2. Residual gravity anomaly map of the Newark-Gettysburg Triassic basin [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 280, **1976.**
3. Variation of remanent and induced magnetization across an intrusive contact: diabase and hornfels from the Newark Triassic basin [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 1129, **1976.**
4. (and Meyer, R. F., Dunleavy, J. M., and Fleming, R. S.). Principal facts for gravity stations in the Newark-Gettysburg Triassic basin, Pennsylvania and adjacent states: U.S. Geological Survey Open-File Report 76-302, 30 p., **1976.**
5. Geophysical investigation of the structural framework of the Newark-Gettysburg Triassic basin, Pennsylvania: Geological Society of America Bulletin, v. 88, no. 7, p. 935-942, illus., **1977.** The author discusses a residual gravity map developed for the Newark-Gettysburg Triassic basin. In a general way, the map shows gravity lows over Triassic sedimentary rocks and gravity highs over Triassic diabase bodies and pre-Triassic rocks that flank the basin. Steep gravity gradients near the basin margins are interpreted to be due to vertical offset on faults within the basin.

See also Fleming, Robert S., Jr., 2; Muller, Otto H., 1.

SUSQUEHANNA RIVER BASIN COMMISSION

1. Comprehensive plan for management and development of the water resources of the Susquehanna River basin: Susquehanna River Basin Commission, 127 p., variously paginated appendices, illus., **1973.** Program areas include floodplain management and protection, water supply, water quality, recreation, fish and wildlife, and watershed protection and management.

SUTTER, J. F.

1. (and Popek, J. P., and Dallmeyer, R. D.). $^{40}Ar/^{39}Ar$ age and petrology of gneisses from the southern Reading Prong, N. J.-Pa.: their bearing on post-Grenville tectothermal history [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 88, **1978.**

SWAUGER, JAMES L.

1. The Dunn Petroglyphs Site (36-Fa-54): Pennsylvania Archaeologist, v. 41, no. 3, p. 61-66, illus., **1971.** The Fayette County site is described, its motifs are detailed, and comparisons are made between it and other petroglyph sites of the Upper Ohio Valley.
2. The Rainbow Rocks Petroglyphs Site (36-Ve-20): Pennsylvania Archaeologist, v. 42, no. 3, p. 37-44, illus., **1972.** The Venango County site is described, illustrated, and compared to other petroglyph sites in the Upper Ohio Valley.
3. The Indian God Rock Petroglyphs Site 36Ve36: Pennsylvania Archaeologist, v. 47, no. 1, p. 1-13, illus., **1977.** The Venango County site is described, its motifs are detailed, and comparisons are made between it and other petroglyph sites that the author has examined.

SWEIGARD, RICHARD J.

1. The role of bending in block-glide landslides and overthrust faults: an analytical model: University Park, Pennsylvania State University, M.S. thesis, **1979.**

SWINEHART, JAMES B.

1. (and Williams, E. G.). Influence of paleotopography on the continental and marine cycles of the lowest Conemaugh and Allegheny, western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 38–39, **1970.**

SZUCS, F. K.

1. Pre-Pleistocene drainages of Slippery Rock and Muddy Creeks determined by subsurface exploration [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 39, **1970.**
2. Glacial and proglacial slope forms along a continental glacial boundary [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 226, **1973.**
3. Silver ion geochemistry as a paleoenvironmental tool [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 6, p. 518, **1973.**

TAMM, L. C.

1. Electron petrography of bent augite crystals from the Triassic traps of the Mid-Atlantic states: University Park, Pennsylvania State University, M.S. thesis, **1973.**

TAN, LI-PING

1. Stratiform copper mineralization at Pahaquarry, New Jersey, U.S.A.: Geological Society of China Proceedings, no. 10, p. 145–150, illus., **1967.** The mineralization of the High Falls Formation is shown to extend to Poplar Valley, Wind Gap, and Palmerton, where chalcopyrite and bornite are found, and to Poplar Valley, where pyrite is found.

TARR, EARL G., *see* Parizek, Richard R., 12.

TATLOCK, D. B.

1. (and Grego, J. A.). Upper Devonian stratigraphy and production potential: Pennsylvanian [abs.]: American Association of Petroleum Geologists Bulletin, v. 58, no. 9, p. 1895, **1974.**

TAYLOR, ALFRED R.

1. Geology and mineral resources of the Lock Haven quadrangle, Clinton and Lycoming Counties, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 124a, scale 1:24,000, 1 sheet, **1977.** Bedrock of Ordovician through Pennsylvanian age was mapped. A short text includes brief discussions of the structural and economic geology of the area.
2. The Catskill Formation (Upper Devonian) near Lock Haven in north-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 55, **1979.**

TAYLOR, C. E., *see* Agarwal, R. K., 1.

TEICHERT, CURT

1. *Runzelmarken* (wrinkle marks): Journal of Sedimentary Petrology, v. 40, no. 3, p. 1056–1057, **1970.** "Eolian microridges," identified by a previous worker in the Silurian Keefer Sandstone near Lewistown, are identified by this author as *Runzelmarken.* Their origin is attributed to wind acting on surfaces of wet, fine-grained sediments, either exposed to the air or covered by no more than 1 cm of water.

TEUFEL, LAWRENCE W.

1. (and Groshong, R. H., Jr.). Strain analysis of twinned calcite in a naturally-deformed limestone mudcrack column [abs.]: EOS (American Geophysical Union Transactions), v. 54, no. 4, p. 457–458, **1973.**

TEXTORIS, DANIEL A., *see* Dennison, John M., 1.

THIERS, G. R.

1. (and Lobdell, L. W., and Mihalcin, B. M.). Foundation treatment for Little Blue Run Dam, *in* Rock engineering for foundations and slopes; proceedings of a specialty conference: American Society of Civil Engineers, v. 1, p. 283–307, illus., **1976** [not seen].

THOMANN, W. F.

1. Igneous and metamorphic petrology of the Honey Brook Uplands in the Elverson, Pottstown and Phoenixville 7½′ quadrangles, southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, M.S. thesis, **1977.**

THOMAS, R. E., *see* Hackman, R. J., 1.

THOMPSON, ALLAN M.

1. Geochemistry of color genesis in red-bed sequence, Juniata and Bald Eagle Formations, Pennsylvania: Journal of Sedimentary Petrology, v. 40, no. 2, p. 599–615, illus., **1970.** Geochemical and stratigraphic data indicate that the difference in color between the Upper Ordovician red Juniata Formation and the underlying drab, gray-green Bald Eagle Formation in central Pennsylvania is of secondary, diagenetic origin. Data suggest that red hematite pigment was diagenetically removed from the lower portions of an initially all-red sequence by aqueous reduction and dissolution.
2. Lithofacies and formation nomenclature in Upper Ordovician stratigraphy, central Appalachians: Geological Society of America Bulletin, v. 81, no. 4, p. 1255–1260, illus., **1970.** Historically the Upper Ordovician sequence has been divided into three formations, the Reedsville, Bald Eagle, and Juniata, based mainly on rock color. Recently, the same sequence has been subdivided into six lithofacies, based on lithology only. The author attempts to resolve the conflict between formation and lithofacies nomenclature.
3. Sedimentology and origin of Upper Ordovician clastic rocks, central Pennsylvania: Society of Economic Paleontologists and Mineralogists, Eastern Section, Guidebook, 88 p., illus., **1970.** The sedimentologic and stratigraphic features of units making up much of the classic Taconic clastic wedge of Late Ordovician age in central Pennsylvania were examined.
4. Shallow-water distal turbidites in Ordovician flysch, central Appalachian Mountains, U.S.A.: [abs.], International Geological Congress, 24th, Montreal, Canada, 1972, Abstracts, p. 207, **1972;** International Geological Congress, 24th, Montreal, Canada, 1972, Section 6, Stratigraphy and Sedimentology, p. 89–99, illus., **1972.** A discussion of the petrology and paleoecology of the Reedsville Formation, which

is considered to be distally equivalent to the Martinsburg Formation. Data suggest that the sandstones and silty shales of the Reedsville were deposited from low-energy currents in relatively shallow water.

5. (and Offutt, P. A.). Sedimentologic data on Ordovician-Silurian boundary in central Appalachians [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 3, p. 658, **1972.**
6. Evidence for successive faulting along the Coastal Plain-Piedmont contact, eastern Maryland, Delaware and Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 88, **1978.**
7. (and Bebel, D. J.). Modern seismicity in the Middle Atlantic seaboard region, and some neotectonic implications [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 55, **1979.**
8. (and Hager, G. M.). Lineament studies in structural interpretation of a stabilized orogenic region: Appalachian Piedmont, Delaware and adjacent Pennsylvania, *in* Podwysocki, M. H., and Earle, J. L., eds., Proceedings of the Second International Conference on Basement Tectonics [Newark, Del., 1976]: Denver, Colo., Basement Tectonics Committee, p. 74–85, illus., **1979.** The authors identified and interpreted linear structural elements in a stabilized orogenic region in the eastern Appalachian Piedmont through an integrated analysis of field geology, aeromagnetics, aircraft photography, and satellite imagery.

See also Gohn, Gregory S., 3.

THOMPSON, CAROLYN L., *see* Minkin, Jean A., 1.

THOMPSON, D. R.

1. Complex ground-water and mine-drainage problems from a bituminous coal mine in western Pennsylvania: Association of Engineering Geologists Bulletin, v. 9, no. 4, p. 335–346, illus., **1972.** Discharge from an abandoned oil and gas well is indirectly supplied through a breached abandoned coal mine by a coal washery lagoon.
2. Surface and subsurface mining: policy implications, *in* Kerns, W. R., ed., Public policy on ground water quality protection: Blacksburg, Va., Virginia Polytechnic Institute and State University, p. 22–29, **1977.** Pennsylvania's policy on groundwater protection with respect to surface and subsurface mining is discussed.
3. Surface mining industry in Pennsylvania is now in the ground-water business [abs.]: Ground Water, v. 16, no. 5, p. 358, **1978.**

THOMPSON, PETER R., *see* Lewis, Ralph S., 1.

THOMPSON, RICHARD D.

1. (editor). Environmental geology in the Pittsburgh area: Geological Society of America, Annual Meeting, Washington, D. C., 1971, Field Trip 6, 47 p., illus., **1971.** Includes stops at solid-waste landfills, an area affected by coal mine subsidence, and areas undergoing landsliding as a result of highway construction.

THOMPSON, RICHARD R.

1. (and Benedict, L. G.). Evaluation of coking quality in coal mine planning [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 1139, **1976.**

THOMS, RICHARD E.

1. (and Berg, T. M.). Comparison of the burrowing habits of a Devonian pelecypod with those of a Recent analogue [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 3, p. 267, **1974.**

See also Berg, Thomas M., 10.

THOMSON, KEITH S.

1. New evidence on the evolution of the paired fins of Rhipidistia and the origin of the tetrapod limb, with description of a new genus of Osteolepidae: Postilla, no. 157, 7 p., illus., **1972.** The study of a specimen of *Sterropterygion brandei,* gen. et sp. nov., from an Upper Devonian formation in Lycoming County, shows that a pattern of pectoral and pelvic structure thought to have been directly antecedent to tetrapodal development is probably an adaptation for slow swimming movements. It is proposed that the paired fins were of use in terrestrial excursions as props to raise the trunk, facilitating lung ventilation, and as pivot points as the fish moved by sinuous body undulations.
2. The faunal relationships of rhipidistian fishes (Crossopterygii) from the Catskill (Upper Devonian) of Pennsylvania: Journal of Paleontology, v. 50, no. 6, p. 1203–1208, **1976.** Studies of the occurrence and distribution of rhipidistian fishes from the "Upper Old Red Sandstone" (Catskill) of Pennsylvania confirm that they belong to a widely distributed fauna common to North America, Greenland, Scotland, and the Baltic Province.
3. (and Rackoff, J. S., and Darling, J. S.). Specialized scales in the cloacal region of two Paleozoic fishes; Crossopterygii: Postilla, no. 170, 6 p., illus., **1976.** *Sterropterygion brandei* from the Upper Devonian of Pennsylvania is described.

THOMSON, ROBERT D.

1. (and York, H. F.). The reserve base of U.S. coals by sulfur content (in two parts)—1, The eastern states: U.S. Bureau of Mines Information Circular 8680, 537 p., illus., **1975.** The coal- reserve base for Pennsylvania, compiled to January 1, 1974, for bituminous and anthracite coal in beds 28 inches or more in thickness to a maximum depth of 1,000 feet, was 31,001 million tons. The reserve base is itemized by county, bed, thickness, type of mining, and sulfur range.

THRELKELD, C. N., *see* Claypool, G. E., 1.

TIBERIO, ROBERT D., *see* McDuffie, Bruce, 1.

TILLING, ROBERT I., *see* Gottfried, David, 1.

TILLMAN, JAMES E.

1. (and Khoury, S. G., Wallach, J. L., and Archer, B.). A simplified classification of the Glenarm and Wissahickon in southeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 125–126, **1975.**

See also Khoury, S. G., 2; Wallach, Joseph L., 1.

TIPNIS, RAVINDRA S.

1. (and Goodwin, P. W.). Lower Ordovician conodonts from the Stonehenge Formation of Pennsylvania and Maryland [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 5, p. 352, **1972.**
2. Conodont biostratigraphy of the Stonehenge Formation: Philadelphia, Temple University, M.S. thesis, **1973.**

TITUS, S.

1. Composition of Mississippian strata of northwestern Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1975.**

TODD, S. J.

1. (and Robinson, J.). Evaluation of selected coal seams from the northern Appalachian coal fields, *in* Donahue, Jack, and Rollins, H. B., eds., Geology of the northern Appalachian coal field: International Congress of Carboniferous

Stratigraphy and Geology, 9th, Field Trip 2, Guidebook, University of Pittsburgh and Pittsburgh Geological Society, p. C1–C22, illus., **1979.** Four of the seven sample localities (one in the Waynesburg seam and two in the Upper Freeport seam in the Main Bituminous field, and one in the Mammoth seam in the Southern Anthracite field) are in Pennsylvania. For each locality in the Main Bituminous field, a description of the sampled face is given. For all localities, proximate and ultimate analyses of the coals are presented in tabular form.

TOLE, P. M.

1. The uranium content of zircons from the Catskill Formation, eastern Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1979.**

TOMPKINS, EDWARD A.

1. Soil survey of Bucks and Philadelphia Counties, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 130 p., illus. including soils maps, **1975.** Includes detailed descriptions and classifications of the soils as well as soils-association maps.

TOPP, LINDA M.

1. Bedrock configuration and depth of glacial drift in Blooming Valley quadrangle, Crawford County, Pennsylvania: Meadville, Pa., Allegheny College, Bachelor's thesis, **1973.**

See also Harrison, Samuel S., 2.

TOUREK, THOMAS J.

1. The depositional environments and sediment accumulation models for the Upper Silurian Wills Creek Shale and Tonoloway Limestone, central Appalachians: Baltimore, Md., Johns Hopkins University, Ph.D. thesis, **1971;** [abs.], Dissertation Abstracts International, v. 32, no. 1, p. 382B, **1971.**

TOURTELOT, HARRY A.

1. (and Meier, A. L.). Lithium in clayey rocks of Pennsylvania[n] age, western Pennsylvania, *in* Vine, J. D., ed., Lithium resources and requirements by the year 2000: U.S. Geological Survey Professional Paper 1005, p. 128–137, illus., **1976.** Data on the lithium content for numerous shale and underclay samples are presented, and possible methods of lithium accumulation are considered.

TRAINER, FRANK W.

1. (and Watkins, F. A., Jr.). Use of base-runoff recession curves to determine areal transmissivities in the Upper Potomac River basin: Journal of Research of the U.S. Geological Survey, v. 2, no. 1, p. 125–131, illus., **1974.** The recession curve was used along with other data to estimate average basin values of transmissivity from streamflow data. Simple and compound recession curves are discussed.

TRAUTWEIN, WILLIAM B.

1. Use of water temperature study to define seepage paths: Association of Engineering Geologists Bulletin, v. 7, no. 1–2, p. 11–20, illus., **1970** [not seen].

TRAVERSE, ALFRED

1. Plant microfossils help date rocks of questionable age: Earth and Mineral Sciences, v. 43, no. 4, p. 28–29, illus., **1974.** A short history of stratigraphic palynology is given, and examples of the general application of palynological dating in Pennsylvania are cited.

See also Streel, Maurice, 1, 2; Strother, P. K., 1, 2, 3; Warg, Jamison B., 1, 3; Wilson, B. R., 1, 2.

TREGASKIS, SCOTT W.

1. Geological and geochemical studies of the Woodbury zinc and lead occurrences, Bedford County, Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1979.**

TREMBLEY, J. A., *see* Muller, Otto H., 1.

TRENT, VIRGIL A., *see* Coleman, S. Lynn, 1.

TROJAN, EDWARD J.

1. The Route 202 sinkhole—A case history, *in* Amenta, R. V., and others, Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, p. 33–40, illus., **1974.** Geological and geophysical data relevant to an engineering analysis of a persistent sinkhole that developed on U.S. Route 202 near King of Prussia are summarized. Design changes necessary to stabilize the area are discussed.

See also Amenta, Roddy V., 4.

TROUTMAN, STEVE E., *see* Bender, Daniel J., 1.

TROUTT, R. WILLIAM

1. An occurrence of large scale, inactive, sorted patterned ground south of the glacial border in central Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1971.**

TROXELL, JOHN, *see* Miller, R. Adam, 1.

TRUHLAR, JOHN F.

1. (and Reed, L. A.). Occurrence of pesticide residues in four streams draining different land-use areas in Pennsylvania: U.S. Geological Survey Water-Resources Investigations 6–75, 23 p., illus., **1975.** The authors tried to determine the degree of contamination from pesticides and whether the contamination was hazardous to humans or aquatic life. The four basins were those drained by Young Womans Creek in Clinton, Potter, and Lycoming Counties, Bixler Run in Perry County, an unnamed tributary of Spring Creek in Dauphin County, and an unnamed tributary of Latimore Creek in Adams County.

TSCHRIN, CHARLES R., *see* McKown, Mary M., 1.

TUCKER, E., JR., *see* Masteller, E. C., 1.

TULLIS, TERRY E., *see* Holeywell, Roger C., 1.

TURNER-PETERSON, CHRISTINE E.

1. Sedimentary framework and uranium potential of the Newark basin, Pennsylvania and New Jersey [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 1149, **1976;** [abs.], Economic Geology, v. 72, no. 4, p. 742–743, **1977.**
2. Lacustrine sedimentation in Newark basin, Pennsylvania-New Jersey, and implications for uranium mineralization [abs.]: American Association of Petroleum Geologists Bulletin, v. 61, no. 5, p. 836–837, **1977.**
3. Uranium mineralization during early burial, Newark basin, Pennsylvania-New Jersey, *in* Campbell, J. A., ed., Short papers of the U.S. Geological Survey uranium-thorium symposium, 1977 [1977 Uranium and Thorium Research and Resources Conference, Golden, Colo.]: U.S. Geological Survey Circular 753, p. 3–4, **1977.**

TURTLE CREEK WATERSHED ASSOCIATION

1. Acid mine drainage in the Turtle Creek watershed: sources, problems, and abatement: Pennsylvania Department of Environmental Resources, Operation Scarlift Project BE 65:1-101.3, 67 p., illus., **1973.** This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

TYRELL, MILES E., *see* Hoover, Karl V., 3.

UDAGAWA, S., *see* Williams, Eugene G., 10.

UHRIN, DAVID C.

1. The feasibility of producing a photo-interpretation map of landslide prone areas suitable for land-use planning: Ohio State University, M.S. thesis, **1973.**
2. Photo-interpretation of landslide-prone areas in eastern Washington County, Pennsylvania, and survey of residents of the Pittsburgh region, for land-use planning [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 6, p. 550-551, **1974.**

ULMER, GENE C.

1. Chromite alteration in the Pa.-Md. Stateline serpentinization district [abs.]: EOS (American Geophysical Union Transactions), v. 53, no. 4, p. 535, **1972.**
2. Alteration of chromite during serpentinization in the Pennsylvania-Maryland district: American Mineralogist, v. 59, no. 11-12, p. 1236-1241, illus., **1974.** A ferrit-chromit rind completely encloses the chromite grains and has an irregular overgrowth of magnetite. The author suggests that mobilization of chromium by deuteric solutions may be more likely than previously thought and that serpentinization at 200°C or even ambient conditions is possible.

UNITED STATES ARMY CORPS OF ENGINEERS

1. Lock Haven, Clinton County, Pa.: Ninety-fourth Congress, Second Session, House Document 94-577, Washington, D. C., U.S. Government Printing Office, 527 p., illus., **1976** [not seen].
2. Wyoming Valley, Pennsylvania: Ninety-fourth Congress, Second Session, House Document 94-472, Washington, D. C., U.S. Government Printing Office, 407 p., illus., **1976** [not seen].
3. Presque Isle Peninsula, Erie, Pennsylvania: Washington, D. C., U.S. Government Printing Office, 319 p., illus., **1978** [not seen].

UNITED STATES BUREAU OF MINES

1. Potential oil recovery by waterflooding reservoirs being produced by primary methods: U.S. Bureau of Mines Information Circular 8455, 53 p., illus., **1970.** In 1967, two thirds of the oil produced in Pennsylvania was by water injection. Most of the potential reserves were in reservoirs of Devonian age. By the use of waterflooding, oil production in the state could be extended for several years.
2. Strippable reserves of bituminous coal and lignite in the United States: U.S. Bureau of Mines Information Circular 8531, 148 p., illus., **1971**; U.S. Bureau of Mines Open-File Report 6-71, 229 p., illus., **1971.** The strippable reserves of Pennsylvania

coal are listed. Most is high-sulfur coal (more than 2 percent sulfur), and the remainder is medium-sulfur coal (1 to 2 percent sulfur). Butler, Clearfield, and Washington Counties have the most reserves. Principal seams are the Upper Freeport, Lower Freeport, and Lower Kittanning.

3. Methods and costs of coal refuse disposal and reclamation: U.S. Bureau of Mines Information Circular 8576, 36 p., illus., **1973.** Procedures, costs, and results of six state-sponsored and two industry-sponsored coal-refuse reclamation projects in Washington, Indiana, Centre, and Westmoreland Counties are discussed.
4. The reserve base of bituminous coal and anthracite for underground mining in the eastern United States: U.S. Bureau of Mines Information Circular 8655, 428 p., illus., **1974.** The reserve base of coal greater than 28 inches to a maximum depth of 1,000 feet is listed by county, bed, thickness (28 to 42 inches, and greater than 42 inches), and sulfur range.
5. Projects to expand fuel sources in eastern states—Survey of planned or proposed coal mines, coal and noncoal conversion plants, electric generating plants, oil refineries, uranium enrichment facilities, and related infrastructure, in states east of the Mississippi River (as of June 1976): U.S. Bureau of Mines Information Circular 8725, 114 p., illus., **1976.** Proposed or planned fuel-related projects in Pennsylvania, including oil and gas pipelines, railroads, terminal facilities, and gas storage projects, are listed.

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

1. Soil survey laboratory data and descriptions for some soils of Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, Soil Survey Investigations Report 27, 81 p., **1974** [not seen].

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UNITED STATES GEOLOGICAL SURVEY

1. Floods at Harrisburg, Pennsylvania: U.S. Geological Survey Hydrologic Investigations Atlas HA-57, scale 1:31,680, **1962.** Hydrologic data on the extent, depth, and frequency of flooding on the Susquehanna River are presented.
2. 1969 water resources data for Pennsylvania—Part 1, Surface water records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 306 p., illus., **1970.** The reports in this series contain records by water year of stage, discharge, and quality of gaged streams, stage and contents of lakes and reservoirs, and water levels of observation wells in Pennsylvania.
3. 1970 water resources data for Pennsylvania—Part 1, Surface water records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 332 p., illus., **1971.** See annotation in entry 2 above.
4. 1969 water resources data for Pennsylvania—Part 2, Water quality records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 255 p., illus., **1972.** See annotation in entry 2 above.

5. 1970 water resources data for Pennsylvania—Part 2, Water quality records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 293 p., illus., **1972.** See annotation in entry 2 above.
6. 1971 water resources data for Pennsylvania—Part 1, Surface water records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 308 p., illus., **1972.** See annotation in entry 2 above.
7. 1972 water resources data for Pennsylvania—Part 1, Surface water records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 312 p., illus., **1973.** See annotation in entry 2 above.
8. Aeromagnetic map of part of the Williamsport 1° by 2° quadrangle, Pennsylvania: U.S. Geological Survey Open-File Report 74-17, scale 1:250,000, **1974.**
9. Aeromagnetic map of parts of the Cleveland and Erie 1° by 2° quadrangles, Pennsylvania: U.S. Geological Survey Open-File Report 74-12, scale 1:250,000, **1974.**
10. Aeromagnetic map of parts of the Harrisburg and Baltimore 1° by 2° quadrangles, Pennsylvania: U.S. Geological Survey Open-File Report 74-13, scale 1:250,000, **1974.**
11. Aeromagnetic map of parts of the Pittsburgh and Cumberland 1° by 2° quadrangles, Pennsylvania: U.S. Geological Survey Open-File Report 74-14, scale 1:250,000, **1974.**
12. Aeromagnetic map of parts of the Scranton and Newark 1° by 2° quadrangles, Pennsylvania: U.S. Geological Survey Open-File Report 74-15, scale 1:250,000, **1974.**
13. Aeromagnetic map of parts of the Warren and Buffalo 1° by 2° quadrangles, Pennsylvania: U.S. Geological Survey Open-File Report 74-16, scale 1:250,000, **1974.**
14. Aeromagnetic map of Philadelphia and vicinity, Pennsylvania: U.S. Geological Survey Open-File Report 74-370, scale 1:62,500, **1974.**
15. Hydrologic unit map—1974, State of Pennsylvania: U.S. Geological Survey Hydrologic Unit Map, scale 1:500,000, **1974.** The map shows political subdivisions and codes, and hydrologic regions, subregions, and accounting units that are aggregates of the cataloging units of the U.S. Water Resources Council. The regional, subregional, and accounting units are used for detailed water and land-resources planning and for managing the National Water Data Network.
16. 1971 water resources data for Pennsylvania—Part 2, Water quality records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 330 p., illus., **1974.** See annotation in entry 2 above.
17. 1973 water resources data for Pennsylvania—Part 1, Surface water records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 312 p., illus., **1974.** See annotation in entry 2 above.
18. 1972 water resources data for Pennsylvania—Part 2, Water quality records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 337 p., illus., **1975.** See annotation in entry 2 above.
19. 1973 water resources data for Pennsylvania—Part 2, Water quality records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 429 p., illus., **1975.** See annotation in entry 2 above.
20. 1974 water resources data for Pennsylvania—Part 1, Surface water records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 331 p., illus., **1975.** See annotation in entry 2 above.
21. 1974 water resources data for Pennsylvania—Part 2, Water quality records: U.S. Geological Survey, Water Resources Division, Harrisburg, Pa., 464 p., illus., **1975.** See annotation in entry 2 above.

22. Water resources data for Pennsylvania—Water year 1975—Volume 1, Delaware River basin: U.S. Geological Survey Water-Data Report PA-75-1, 385 p., illus., **1976.** See annotation in entry 2 above.
23. Water resources data for Pennsylvania—Water year 1975—Volume 2, Susquehanna and Potomac River basins: U.S. Geological Survey Water-Data Report PA-75-2, 363 p., illus., **1976.** See annotation in entry 2 above.
24. Water resources data for Pennsylvania—Water year 1975—Volume 3, Ohio River and St. Lawrence River basins: U.S. Geological Survey Water-Data Report PA-75-3, 196 p., illus., **1976.** See annotation in entry 2 above.
25. Water resources data for Pennsylvania—Water year 1976—Volume 1, Delaware River basin: U.S. Geological Survey Water-Data Report PA-76-1, 371 p., illus., **1977.** See annotation in entry 2 above.
26. Water resources data for Pennsylvania—Water year 1976—Volume 2, Susquehanna and Potomac River basins: U.S. Geological Survey Water-Data Report PA-76-2, 395 p., illus., **1977.** See annotation in entry 2 above.
27. Water resources data for Pennsylvania—Water year 1976—Volume 3, Ohio River and St. Lawrence River basins: U.S. Geological Survey Water-Data Report PA-76-3, 262 p., illus., **1977.** See annotation in entry 2 above.
28. Aeromagnetic map of Pennsylvania, 1978: U.S. Geological Survey Geophysical Investigations Map GP-924, scale 1:250,000, 2 sheets, **1978.**
29. Water resources data for Pennsylvania—Water year 1977—Volume 1, Delaware River basin: U.S. Geological Survey Water-Data Report PA-77-1, 367 p., illus., **1978.** See annotation in entry 2 above.
30. Water resources data for Pennsylvania—Water year 1977—Volume 2, Susquehanna and Potomac River basins: U.S. Geological Survey Water-Data Report PA-77-2, 384 p., illus., **1978.** See annotation in entry 2 above.
31. Water resources data for Pennsylvania—Water year 1977—Volume 3, Ohio River and St. Lawrence River basins: U.S. Geological Survey Water-Data Report PA-77-3, 272 p., illus., **1978.** See annotation in entry 2 above.
32. Land use and land cover, 1970-72, Pittsburgh, Pennsylvania: U.S. Geological Survey Land Use and Land Cover Map L-34, scale 1:250,000, **1979.** Major categories shown in this series include urban or built-up land, agricultural land, rangeland, forest land, water, wetland, barren land, tundra, and perennial snow or ice. Subcategories are also shown.
33. Land use and land cover, 1971-74, Williamsport, Pennsylvania: New York: U.S. Geological Survey Land Use and Land Cover Map L-37, scale 1:250,000, **1979.** See annotation in entry 32 above.
34. Land use and land cover, 1972, Cleveland, Ohio; Pennsylvania, U.S.; Ontario, Canada (U.S. portion only): U.S. Geological Survey Land Use and Land Cover Map L-72, scale 1:250,000, **1979.** See annotation in entry 32 above.
35. Land use and land cover, 1972, Harrisburg, Pennsylvania: U.S. Geological Survey Land Use and Land Cover Map L-32, scale 1:250,000, **1979.** See annotation in entry 32 above.
36. Land use and land cover, 1972, Wilmington, Delaware; New Jersey; Pennsylvania; Maryland: U.S. Geological Survey Land Use and Land Cover Map L-38, scale 1:250,000, **1979.** See annotation in entry 32 above.
37. Land use and land cover, 1973, Warren, Pennsylvania; New York: U.S. Geological Survey Land Use and Land Cover Map L-36, scale 1:250,000, **1979.** See annotation in entry 32 above.
38. Land use and land cover, 1974, Erie, Pennsylvania: U.S. Geological Survey Land Use and Land Cover Map L-31, scale 1:250,000, **1979.** See annotation in entry 32 above.

39. Land use and land cover, 1974, Newark, New Jersey; Pennsylvania; New York: U.S. Geological Survey Land Use and Land Cover Map L-33, scale 1:250,000, **1979.** See annotation in entry 32 above.
40. Land use and land cover, 1974, Scranton, Pennsylvania; New York; New Jersey: U.S. Geological Survey Land Use and Land Cover Map L-35, scale 1:250,000, **1979.** See annotation in entry 32 above.
41. Water resources data for Pennsylvania [water year 1978]—Volume 1, Delaware River basin: U.S. Geological Survey Water-Data Report PA-78-1, 374 p., illus., **1979.** See annotation in entry 2 above.
42. Water resources data for Pennsylvania [water year 1978]—Volume 2, Susquehanna and Potomac River basins: U.S. Geological Survey Water-Data Report PA-78-2, 411 p., illus., **1979.** See annotation in entry 2 above.
43. Water resources data for Pennsylvania [water year 1978]—Volume 3, Ohio River and St. Lawrence River basins: U.S. Geological Survey Water-Data Report PA-78-3, 310 p., illus., **1979.** See annotation in entry 2 above.

URBAN, JAMES B.

1. The Mahantango Creek watershed—evaluating the shallow ground-water regime, *in* Correll, D. L., ed., Watershed research in eastern North America—A workshop to compare results: Smithsonian Institution, Chesapeake Bay Center for Environmental Studies, Edgewater, Md., v. 1, p. 251-275, illus., **1977.** Both a perched and a regional groundwater system exist in the watershed area. Sandstone and siltstone wells in valley settings were reportedly the highest yielding. Simulation of groundwater flow using a finite-difference model successfully approximated water-table elevations and baseflow.

URBAN, T. C., *see* Muller, Otto H., 1.

USSLER, BILL

1. The bedrock geology and a paleoenvironmental study of an Upper Mississippian (?) calcite cemented sandstone in the Hillsgrove and Eaglesmere 7½' quadrangles, Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1973.**

VANDALE, AUGUST E.

1. Subsidence—a real or imaginary problem?, *in* McKenzie, G. D., and Russell, O. U., eds., Man and his physical environment—Readings in environmental geology: Minneapolis, Minn., Burgess Publishing Company, p. 91-94, illus., **1972** [reprinted from Mining Engineering, v. 19, no. 9, p. 86-88, 1967].

Van der VOO, ROB

1. (and French, R. B.). Paleomagnetism of the Late Ordovician Juniata Formation and the remagnetization hypothesis: Journal of Geophysical Research, v. 82, no. 36, p. 5796-5802, illus., **1977.** The paleomagnetism of 103 samples from the Juniata Formation was investigated. Thermal demagnetization showed a strong magnetic overprinting in a large number of samples. The magnetization was determined to be secondary, acquired during or after the Late Paleozoic folding of the area.
2. Age of the Alleghenian folding in the central Appalachians: Geology, v. 7, no. 6, p. 297-298, illus., **1979.** On the basis of results from a regional field test of 54 samples, the author concluded that the magnetization predates folding and is pre-

Permian in age. The 54 samples were collected from nine sites in Pennsylvania, Maryland, and West Virginia.

3. (and French, A. N., and French, R. B.). A paleomagnetic pole position from the folded Upper Devonian Catskill red beds, and its tectonic implications: Geology, v. 7, no. 7, p. 345–348, illus., **1979.** Paleomagnetic studies of folded Ordovician and Silurian red beds from the Valley and Ridge province of Virginia to Pennsylvania revealed secondary magnetizations that postdate the folding. It is thought that the Alleghanian folding in the central Appalachians is at least as old as Early Permian and is probably of Late Carboniferous age.

See also Watts, Doyle R., 1.

Van HOUTEN, FRANKLYN B.

1. Triassic-Liassic deposits of Morocco and eastern North America: comparison: American Association of Petroleum Geologists Bulletin, v. 61, no. 1, p. 79–99, illus., **1977.** One of the most often cited trans-Atlantic similarities suggesting continental drift is that of the exposed Triassic-Liassic deposits in eastern North America and Morocco. The Newark and Gettysburg basins are included in the discussion of fault basins in four tectonic provinces that frame the present North Atlantic basin.

Van LIEU, J. A., *see* Patterson, Elmer D., 1, 2.

Van NESS, C. G., *see* Metsger, Robert W., 1.

VARGAS, ALEJANDRO J.

1. Correlation by trace elements of the Hudson River Shale in southeastern New York and the Martinsburg Formation in northwestern New Jersey and eastern Pennsylvania: New York, Queens College of the City University of New York, M.S. thesis, **1976.**

VARRICCHIO, LOUIS

1. The great barrier reef of Pennsylvania: Gems and Minerals, no. 500, p. 6, 20, illus., **1979.** The Centerfield coral reef, near Stroudsburg, is described. A location map is included.

VASKOV, EUGENE

1. Fossil deformation in the Devonian Trimmers Rock of central Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

VENKATARAMANI, R., *see* Stefanko, Robert, 3.

VERNON, JAMES H.

1. Crinoid deformation, Shamokin Mountain: Lewisburg, Pa., Bucknell University, Senior thesis, **1974.**

Ver STEEG, KARL

1. Windgaps and erosion surfaces: American Journal of Science, 5th ser., v. 26, no. 155, p. 507–511, **1933.** The hypothesis that wind gaps occur at certain elevations which mark fluvial base levels is not supported by evidence obtained from profile and field studies of the ridges in eastern Pennsylvania.

VILLAUME, JAMES F.

1. Geochemistry of some Pre-Cambrian ultra mafic rocks: University Park, Pennsylvania State University, M.S. thesis, **1973.**

2. (and Herre, B. H., and Voykin, D. P.). Cleanup of an oil spill into ground water at Williamsport, Pennsylvania; a case history, *in* 1979 Oil Spill Conference (prevention, behavior, control, cleanup): Washington, D. C., American Petroleum Institute, p. 501–505, illus., **1979** [not seen].

VOEGELI, DAVID A.

1. Geochemical and geophysical aspects of mafic and ultramafic rocks from the Precambrian core of the Mine Ridge anticline, Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1972.**

VOLK, KAREN W.

1. Preliminary paleomagnetic results for a Rossville-type diabase dike system in southeastern Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1974.**
2. Probable PSD behaviour in the Rossville-type diabase of Pennsylvania: Royal Astronomical Society Geophysical Journal, v. 49, no. 3, p. 685–693, illus., **1977.** A study of magnetic domain structures of Mesozoic diabases reveals the Rossville type to have a multidomained primary structure, and the York Haven type to be primarily single domained. However, the Rossville type does not exhibit typical multidomained behavior. Several lines of evidence suggest pseudo-single-domain behavior.
3. The paleomagnetism of Mesozoic diabase and the deformational history of southeastern Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1977**; [abs.], Dissertation Abstracts International, v. 38, no. 10, p. 4698B, **1978.**

VONARX, CLIFFORD E.

1. Geology of the Horseshoe Curve, Upper Devonian to Lower Pennsylvanian: University Park, Pennsylvania State University, M.Ed. thesis, **1979.**

von HAKE, CARL A.

1. Earthquake history of Pennsylvania: Earthquake Information Bulletin, v. 8, no. 4, p. 28–31, illus., **1976.** Reported earthquakes from 1737 to 1972 are discussed.

VOYKIN, DALE P., *see* Villaume, James F., 2.

VREELAND, L. JUDITH

1. Intraformational deformation in the Mifflintown Formation, central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 57–58, **1979.**

WADDELL, CLAUDIA T.

1. Study of the interrelationships among chemical and petrographic variables of United States coals: University Park, Pennsylvania State University, M.S. thesis, **1978.**

WADDELL, RICHARD K., JR.

1. Evaluation of a surficial application of limestone and flue dust in the abatement of acidic drainage: Jonathan Run drainage basin at Interstate 80, Centre Coun-

ty, Pennsylvania: University Park, Pennsylvania State University, Ph.D. thesis, **1978**; [abs.], Dissertation Abstracts International, v. 39, no. 2, p. 630B, **1978.**

WADE, WILLIAM M., *see* Frischmann, Peter S., 1.

WAGNER, JOHN R.

1. (and Goodwin, P. W.). Facies patterns and cyclicity in the tide-dominated Silurian Clinton Formation at Schuylkill Gap, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 327–328, **1977.**
2. Facies comparison of Silurian clastics in Tennessee and Pennsylvania: contributions toward a regional synthesis of depositional environments [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 4, p. 201, **1978.**

WAGNER, MARY EMMA M.

1. Metamorphism of the Precambrian Baltimore Gneiss in southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, Ph.D. thesis, **1972**; [abs.], Dissertation Abstracts International, v. 33, no. 10, p. 4868B, **1973.**
2. (and Crawford, M. L.). Metamorphism of the Precambrian Baltimore Gneiss in southeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 234, **1973.**
3. Baltimore Gneiss, *in* Amenta, R. V., and others, Geology of the Piedmont of southeastern Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 39th, King of Prussia, Pa., Guidebook, p. 20–21, **1974.** A summary of the Precambrian gneiss.
4. (and Crawford, M. L.). Polymetamorphism of the Precambrian Baltimore Gneiss in southeastern Pennsylvania: American Journal of Science, v. 275, no. 6, p. 653–682, illus., **1975.** The petrology and metamorphic history of the granulite facies gneisses that form the central part of the blocks of Grenville age rocks lying west of Philadelphia were described.

See also Amenta, Roddy V., 4; Grauert, Borwin W., 1, 2, 3, 4.

WAGNER, WALTER R.

1. Characteristics and depositional environments of the rocks of Allegheny County, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 8–40, illus., **1970.** A general description of the sedimentary features of the rocks found in Allegheny County. Also discussed are the environments in which the rock-forming sediments were deposited.
2. Invertebrate and plant fossils, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 71–80, illus., **1970.** Some of the invertebrate and plant fossils found in Allegheny County are illustrated and briefly described.
3. Petroleum and natural gas, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 116–119, illus., **1970.** A history of oil and gas production in Allegheny County from the first well drilled in the Mount Nebo field in Ohio Township to present-day gas wells. A map is included showing locations of oil- and gas-producing fields and gas storage fields.
4. Stratigraphy, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 41–59, illus., **1970.** A general description of the sedimentary characteristics of each stratigraphic

group exposed in the Pittsburgh area. Specific locations of examples are provided. General stratigraphic concepts are explained.

5. Structural geology, *in* Wagner, W. R., and others, Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, p. 60–71, illus., **1970.** The structural features of the rocks in Allegheny County are described and illustrated. Good examples of joints and faults in the county are given. Local folding and its relationship to the Pittsburgh-Huntington basin are explained.
6. (and Heyman, Louis, Gray, R. E., Belz, D. J., Lund, Richard, Cate, A. S., and Edgerton, C. D.). Geology of the Pittsburgh area: Pennsylvania Geological Survey, 4th ser., General Geology Report 59, 145 p., illus., **1970.** An interpretation of the geology around Pittsburgh, Allegheny County, is presented, and emphasis is placed on specific localities. Topics include the regional setting, characteristics and depositional environments of the rocks, stratigraphy, structural geology, fossils, rivers, soils and landslides, and economic geology. Articles by individual authors are annotated separately.
7. Growth faults in Upper Cambrian and Lower Ordovician rocks of western Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 10, p. 2110, **1972.**
8. (and Lytle, W. S.). Stratigraphic framework of the greater Pittsburgh area, Parts I and II: Pennsylvania Geological Survey, 4th ser., Open-File Report, Pittsburgh office, 20 p., 9 sections in 13 sheets, **1972.**
9. (and Craft, J. L., Heyman, L., and Harper, J. A., compilers). Greater Pittsburgh Region geologic map and cross sections: Pennsylvania Geological Survey, 4th ser., Map 42, scale 1:125,000, 6 pls., **1975.** The geologic map shows rock units ranging in age from Mississippian (Pocono Formation) to Permian (Greene Formation), and also shows unconsolidated alluvial and terrace deposits of Quaternary age. The other plates show representative geologic cross sections in the region. A stratigraphic column is included on the geologic map. The stratigraphy, economic geology, and groundwater characteristics and environmental aspects of the rock units are discussed briefly.
10. (and Heyman, L., Craft, J. L., Edmunds, W. E., and Harper, J. A.). Greater Pittsburgh Region structure contour map: Pennsylvania Geological Survey, 4th ser., Map 43, scale 1:125,000, **1975.** Contours are drawn on the top of the Pittsburgh coal bed in the southern part of the region, the top of the Upper Freeport coal bed in the central and southeastern parts, and the top of the Vanport Limestone in the northern part. Contour intervals are 20 feet in most of the area, and 50 feet in the remainder.
11. Growth faults in Cambrian and Lower Ordovician rocks of western Pennsylvania: American Association of Petroleum Geologists Bulletin, v. 60, no. 3, p. 414–427, illus., **1976.** The author outlines the Late Cambrian and Early Ordovician stratigraphy and structure of western Pennsylvania, shows the effect of growth faults, and speculates on the configuration of the basement surface.
12. (and Lytle, W. S.). Greater Pittsburgh Region revised surface structure and its relation to oil and gas fields: Pennsylvania Geological Survey, 4th ser., Information Circular 80, 20 p., illus., **1976.** The authors suggest that detailed surface structures may be used as a clue for exploration for oil and gas. Data from logs of oil and gas wells and outcrop data from strip mining pits, coal mine entries, and quarries were used to determine the relationship of anticlinal and synclinal

axes and lines of structural discontinuity to the oil and gas fields and to surface drainage.

See also Kelley, D. R., 3, 4, 6; Lytle, William S., 7.

WAITE, BURT A.

1. (and Gough, W. R.). Ground-water monitoring plans for underground coal mines in Pennsylvania as required by the U.S. Department of Interior Office of Surface Mining [abs.]: Ground Water, v. 17, no. 5, p. 492–493, **1979.**

WALKER, P. L., JR., *see* Spackman, W., 1.

WALKER, ROGER G.

1. (and Harms, J. C.). Thin marine-nonmarine alternations in Upper Devonian "Catskill delta" [abs.]: American Association of Petroleum Geologists Bulletin, v. 54, no. 5, p. 874, **1970.**
2. Non-deltaic depositional environments in the Catskill clastic wedge (Upper Devonian) of central Pennsylvania: Geological Society of America Bulletin, v. 82, no. 5, p. 1305–1326, illus., **1971.** The Catskill clastic wedge consists of turbidites, slope deposits, alternating shallow marine and nonmarine sediments, and alluvial-plain fining-upward sequences. The author's thesis is that no deltaic depositional environments are present within the Catskill clastic wedge of south-central Pennsylvania.
3. (and Harms, J. C.). The "Catskill delta": a prograding muddy shoreline in central Pennsylvania: Journal of Geology, v. 79, no. 4, p. 381–399, illus., **1971.** The vertical facies sequences found in the Catskill Formation are described. The Catskill deltaic complex represents a regressive sequence built into the Upper Devonian basin as a result of the Acadian orogeny.
4. Upper Devonian marine-nonmarine transition, southern Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 62, 25 p., illus., **1972.** A concise interpretation of the development of part of the Devonian Catskill delta is presented, together with columnar sections of the more continuous outcrops. Suggestions are made for one- and two-day field trips.
5. (and Harms, J. C.). Shorelines of weak tidal activity: Upper Devonian Catskill Formation, central Pennsylvania, *in* Ginsburg, R. N., ed., Tidal deposits—A casebook of recent examples and fossil counterparts: New York, Springer-Verlag, p. 103–108, illus., **1975.** Because of the lack of intertidal deposits in the Irish Valley Member of the Catskill Formation in central Pennsylvania, and the presence of 20 to 25 repeated marine-nonmarine lithofacies sequences, the authors believe that a muddy shoreline prograded rapidly into a sea of low tidal range, and that any intertidal fringe was restricted in area and migrated too rapidly to form a significantly thick record.

WALLACE, LAURE G.

1. (and de Witt, Wallace, Jr.). Maps showing selected deep wells drilled for oil or gas in the Appalachian basin: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-936, scale 1:1,000,000, 3 sheets, **1975.** Wells are plotted on maps and also listed in chart form. For each well, county and township location, farm or lease name, company name, stratigraphic information, and total depth are given. Two hundred eight wells are identified for Pennsylvania.
2. (and Roen, J. B., and de Witt, Wallace, Jr.). Preliminary stratigraphic cross section showing radioactive zones in the Devonian black shales in the western part of the Appalachian basin: U.S. Geological Survey Oil and Gas Investigations Chart OC-80, 2 sheets, **1977.** This work provides a preliminary regional stratigraphic

framework and provisional nomenclature as a basis for future detailed mapping and geologic analyses of the black shales.

See also de Witt, Wallace, Jr., 7, 9; Roen, John B., 8, 9, 10.

WALLACE, ROBERT J.

1. (and Chamberlain, J. A., Jr.). Paleoecology and community succession of a Devonian patch reef [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 129–130, **1975.**

See also Wolosz, Thomas H., 1.

WALLACH, JOSEPH L.

1. (and Khoury, S. G., and Tillman, J. E.). Relative importance of the Drumore fold and Peach Bottom fold in the Piedmont of southeastern Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 294, **1976.**

See also Khoury, S. G., 2; Tillman, James E., 1.

WALTON, JOHN C.

1. (and Messinger, D. J., Fahnestock, R. K., and Nummedal, Dag). Environments of erosion and deposition on a recurved sandspit, Presque Isle, Erie, PA [abs.]: Geological Society of America Abstracts with Programs, v. 7, no. 1, p. 130–131, **1975.**

WARD, ALBERT N., JR.

1. Bedrock stratigraphy, *in* Ward, A. N., Jr., and others, Bedrock and glacial geology of northwestern Pennsylvania in Crawford, Forest and Venango Counties: Annual Field Conference of Pennsylvania Geologists, 41st, Titusville, Pa., Guidebook, p. 7–17, illus., **1976.** Upper Devonian, Mississippian, and Lower Pennsylvanian rocks are examined. Some of the units exhibit rapid lateral and vertical lithic changes.
2. (and Chapman, W. F., Lukert, M. T., and Craft, J. L.). Bedrock and glacial geology of northwestern Pennsylvania in Crawford, Forest and Venango Counties: Annual Field Conference of Pennsylvania Geologists, 41st, Titusville, Pa., Guidebook, 64 p., illus., **1976.** Short articles on the bedrock of the area, the glacial geology around Oil City, and the Drake well. A road log accompanies descriptions of 11 geology localities.
3. (and Lukert, M. T., and Chapman, W. F.). Geology and mineral resources of the Oil City quadrangle, Venango County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Atlas 33a, scale 1:24,000, 1 sheet, **1979.** Rocks of Mississippian and Pennsylvanian age were mapped. A separate insert map shows glacial deposits. The groundwater, engineering, and mineral-resource characteristics of each unit are discussed briefly in the map explanation.

See also Chapman, William F., 3; Craft, Jesse L., 6; Hinds, Robert W., 1; Lukert, Michael T., 1.

WARD, JANICE R.

1. Preliminary results of preimpoundment water-quality studies in the Tioga River basin, Pennsylvania and New York: U.S. Geological Survey Water-Resources Investigations 76–66, 79 p., illus., **1976.** A report of data collected monthly at sampling points on the Tioga River and its major tributaries from September 1973 to May 1975; includes chemical analyses.
2. Nonpoint discharge of sediment and nutrients in Pequea Creek basin, Pennsylvania [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 18, p. 253, **1979.**

3. (and Eckhardt, D. A.). Nonpoint-source discharges in Pequea Creek basin, Pennsylvania: U.S. Geological Survey Water-Resources Investigations 79–88, 108 p., **1979** [not seen].

JOSEPH S. WARD AND ASSOCIATES

1. Northeastern Pennsylvania; toward the year 2000: Economic Development Council of Northeastern Pennsylvania, Avoca, Pa., variously paginated, illus. including geologic maps, **1975** [not seen].

WARG, JAMISON B.

1. (and Traverse, Alfred). Palynomorphs from shales and "coals" of a Devonian-Mississippian transition zone, central Pennsylvania [abs.]: American Association of Stratigraphic Palynologists, Annual Meeting, 4th, Abstracts of Papers, p. 31, **1971.**
2. A palynological study of shales and "coals" of a Devonian-Mississippian transition zone, central Pennsylvania: University Park, Pennsylvania State University, M.S. paper, **1972.**
3. (and Traverse, Alfred). A palynological study of shales and "coals" of a Devonian-Mississippian transition zone, central Pennsylvania, *in* American Association of Stratigraphic Palynologists, Proceedings of the Fourth Annual Meeting [1971]: Geoscience and Man, v. 7, p. 39–46, illus., **1973.** Spores from carbonaceous shales and coals found in roadcuts along Interstate Route 80 in Centre County were studied. Similar associations of spores found elsewhere represent the Devonian-Mississippian transition zone. This zone may constitute a worldwide marker horizon.

WARTERS, H. R.

1. Pinnacle reefs of Middle Devonian Onondaga Limestone, upstate New York and northern Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 3, p. 660, **1972.**

WARTINBEE, DAVID C.

1. (and Coffman, W. P.). Quantitative determination of chironomid emergence from enclosed channels in a small ecosystem: American Midland Naturalist, v. 95, no. 3, p. 479–485, **1976.** A study was undertaken to measure emergence rates of Chironomidae from riffle-and-pool intermediate substrates of Linesville Creek, Crawford County. The collection device described in this article provides a means for quantitative measurement of emergence rates of chironomids from relatively large, undisturbed areas of specific biotopes in shallow streams.

WASIOLEK, MARYANN

1. The chemistry of the metarhyolite rocks of South Mountain, Pennsylvania: Lewisburg, Pa., Bucknell University, Senior thesis, **1975.**

WATKINS, EDMUND H., *see* Stefanko, Robert, 4.

WATKINS, FRANK A., JR., *see* Trainer, Frank W., 1.

WATSON, W. M., *see* Westerstrom, L. W., 1.

WATTS, DOYLE R.

1. (and French, R. B., and Van der Voo, Rob). Paleomagnetic investigation of the Cambrian Waynesboro and Rome Formations of the Valley and Ridge province of the Appalachian Mountains [abs.]: EOS (American Geophysical Union Transactions), v. 60, no. 42, p. 749, **1979.**

WATTS, W. A.

1. Late Quaternary vegetation of central Appalachia and the New Jersey coastal plain: Ecological Monographs, v. 49, no. 4, p. 427–469, illus., **1979** [not seen].

WAY, JOHN H., JR.

1. Barite-limonite from the Altoona-Hollidaysburg area: Pennsylvania Geology, v. 4, no. 3, p. 4–7, illus., **1973.** A previously unreported locality for barite in limonite was located near Hollidaysburg, Blair County, in the Tonoloway Formation of Late Silurian age.
2. Stalactitic limonite: Pennsylvania Geology, v. 4, no. 4, p. 31–32, illus., **1973.** The stalactitic limonite occurrence at the Eldorado stone quarry south of Altoona is reported.
3. On the demise of a *Trimerus* (*Dipleura*) *dekayi:* Pennsylvania Geology, v. 10, no. 3, p. 14–16, illus., **1979.** A trilobite specimen found in the Mahantango Formation near Danville, Montour County, is reviewed.

See also Inners, Jon D., 11; Smith, Robert C., II, 11.

WEAVER, O. D.

1. Predictions of future exploratory trends in Appalachian basin [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 10, p. 2110–2111, **1972.**
2. (and Calvert, W. L., and McGuire, W. H.). A new look at the gas and oil potential of the Appalachian basin: Oil and Gas Journal, v. 70, no. 3, p. 126, 128–130, illus., **1972.** The oil and gas potential of Cambrian, Ordovician, and Silurian sediments of Pennsylvania is discussed.
3. (and Calvert, W. L., and McGuire, W. H.). Here are the principal exploratory objectives of the Appalachian basin: Oil and Gas Journal, v. 70, no. 4, p. 100–104, illus., **1972.** The stratigraphic units for potential oil and gas discoveries are outlined.

See also Mesolella, Kenneth J., 1.

WEBB, J. E., *see* Ferm, John C., 9.

WEBER, JON N.

1. (and Bergenback, R. E., Williams, E. G., and Keith, M. L.). Reconstruction of depositional environments in the Pennsylvanian Vanport basin [western Pennsylvania] by carbon isotope ratios, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 114–120, illus., **1979** [reprinted with modifications from Journal of Sedimentary Petrology, v. 35, no. 1, p. 36–48, 1965].
2. (and Williams, E. G., and Keith, M. L.). Paleoenvironmental significance of carbon isotopic composition of siderite nodules in some shales of Pennsylvanian age [western Pennsylvania], *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 110–113, illus., **1979** [reprinted from Journal of Sedimentary Petrology, v. 34, no. 4, p. 814–818, 1964].

WEBSTER, BUD, *see* Shelton, Bill, 1.

WEBSTER, DAVID

1. (and Aldenderfer, Mark, Hatch, J. W., and Hay, R. A.). The Milesburg site: a hunting camp in central Pennsylvania: Pennsylvania Archaeologist, v. 44, no. 4, p. 37–47, **1977.** Excavation at the site in Centre County indicated a long series of minor occupations extending from Early Archaic to Late Woodland time.

WEGNER, ROBERT C.

1. Gravity anomalies in east-central Pennsylvania: Bethlehem, Pa., Lehigh University, M.S. thesis, **1972.**

WEHLER, NED E., *see* Miller, Jere F., 1.

WEHMILLER, JOHN F.

1. Downtown response of a small watershed to impervious surfaces—an example? [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 84, **1974.**

WEIL, CHARLES B.

1. Sediment distribution in the Upper Delaware River estuary [abs.]: Geological Society of America Abstracts with Programs, v. 2, no. 1, p. 40, **1970.**

WEINMAN, BARRY L.

1. Geophysical, geochemical and remote sensing studies of Pennsylvania's thermal springs: University Park, Pennsylvania State University, M.S. thesis, **1976.**

See also Alexander, Shelton S., 2.

WEIS, P. L., *see* Lesure, F. G., 1.

WEISENFLUH, GERALD A., *see* Ferm, John C., 6.

WELCH, J. DAVID

1. Environmental geology survey, regional land use and intermodal transportation planning, northeastern Pennsylvania: Highway Geology Symposium, 26th, Coeur d'Alene, Ida., 1975, Proceedings, p. 43–100, illus., **1975.** Wayne, Pike, Monroe, Carbon, Schuylkill, Luzerne, and Lackawanna Counties were evaluated for eight geologic conditions affecting the environment, and four representative local areas were evaluated in detail for geologic constraints to planning.

WELLS, RALPH G.

1. Rare earth minerals from Pennsylvania: Rocks and Minerals, v. 53, no. 3, p. 108–111, illus., **1978.** Rare earth minerals that occur in Pennsylvania are identified and their localities are given.

WELLS, RICHARD B.

1. Agnes' lacustrine legacy: Pennsylvania Geology, v. 3, no. 4, p. 30–31, illus., **1972.** The flood caused by tropical storm Agnes resulted in changes in the topography of Pennsylvania, including the creation of new lakes. Two such lakes are in Lycoming and Montour Counties.
2. Simplified method for calculation of mineral reserves or "the Pennsylvania planimeter eliminator": Pennsylvania Geology, v. 3, no. 3, p. 4–5, illus., **1972.** A new method of computing coal reserves, based on point counting rather than on use of the rolling planimeter, is presented. The speed of the point-counting method represents a savings of more than 95 percent in calculation time over the planimeter method, and the difference in the reserve estimates is only about one percent.
3. (and Faill, R. T.). Stratigraphy, *in* Faill, R. T., ed., Structure and Silurian-Devonian stratigraphy of the Valley and Ridge province, central Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 38th, Camp Hill, Pa., Guidebook, p. 4–8, **1973.** Stratigraphic units examined on this field trip include

rocks from the Upper Ordovician Reedsville Formation to the Upper Devonian Catskill Formation.

4. Loyalhanna sandstone extended into north-central Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 1, p. 84–85, **1974.**
5. Quiggleville Gap prospect—Lycoming County: Pennsylvania Geology, v. 7, no. 2, p. 10–13, illus., **1976.** A closure on the Tombs Run anticline southwest of Quiggleville is the type of structural feature that may contain natural gas.
6. New gas discovery in Lycoming County sparks a flurry of activity: Pennsylvania Geology, v. 8, no. 2, p. 2–3, illus., **1977.** Natural gas wells have been drilled in north-central Pennsylvania.
7. (and Inners, J. D.). Fossils in the Lock Haven Formation (Upper Devonian) near Lock Haven, Pennsylvania: Pennsylvania Geology, v. 8, no. 6, p. 6–9, illus., **1977.** A brachiopod collecting locality in Clinton County is reported. A location map is included.
8. Lineament trends in Lycoming County, north-central Pennsylvania [abs.]: Association of Engineering Geologists, Annual Meeting, Program and Abstracts, unpaginated, **1978.**

See also Faill, Rodger T., 3, 10, 11, 14, 15, 17; Miller, John T., 1.

WENZEL, KURT A.

1. The geology of the Ephrata and Lititz lowlands, Lancaster County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

WERNER, MATTHEW L.

1. (and Zalewski, S. A., and Gates, T. M.). Hydrothermal minerals in the northern Newark basin [abs.]: Geological Society of America Abstracts with Programs, v. 9, no. 3, p. 328–329, **1977.**

WESCOTT, W., *see* Heyn, C., 1.

WEST, L. J.

1. (and Perry, R. M.). Rock mechanics studies for a high cut at a nuclear power station in Pennsylvania, *in* Somerton, W. H., ed., Rock mechanics—theory and practice: Symposium on Rock Mechanics, 11th, Berkeley, Calif., 1969, Proceedings, Society of Mining Engineers, American Institute of Mining, Metallurgical, and Petroleum Engineers, p. 445–459, illus., **1970.** Analyses of the curved surface of sliding, as well as sliding-block and finite-element analyses, were performed on the Peters Creek Schist to ascertain the potential for failure of a high cut and to establish the margin of safety.

WEST, MARETA

1. Preliminary stratigraphic cross section showing radioactive zones in the Devonian black shales in the eastern part of the Appalachian basin: U.S. Geological Survey Oil and Gas Investigations Chart OC-86, 2 sheets, **1978.** The cross section is one of a series that will provide a preliminary regional stratigraphic framework and provisional nomenclature for future detailed geologic analyses.

See also de Witt, Wallace, Jr., 9.

WEST, TERRY R.

1. Engineering soil mapping from multispectral imagery using automatic classification techniques [southeastern Pennsylvania]: Highway Research Record, no. 421, p. 58–65, **1972.**

See also Mathews, H. L., 1.

WESTERSTROM, L. W.

1. (and Watson, W. M.). Coal—Pennsylvania anthracite, *in* Metals, minerals, and fuels: U.S. Bureau of Mines Minerals Yearbook 1976, v. 1, p. 379–402, illus., 1978. Total production was about 6.2 million short tons.

WESTLUND, CARLYLE W.

1. Abandoned oil and gas wells in Pennsylvania, their effect on the ground-water flow system, and plugging priority for ground-water protection: University Park, Pennsylvania State University, M.S. thesis, 1976.
2. The state approach to ground-water protection: the Pennsylvania experience, *in* Kerns, W. R., ed., Public policy on ground water quality protection: Blacksburg, Va., Virginia Polytechnic Institute and State University, p. 113–118, 1977.

WESTPHAL, MICHEL, *see* Bertrand, Hervé, 1.

WETMORE, RALPH F., JR., *see* Andrews, Joe A., 1.

WHAITE, RALPH H., *see* Dierks, Henry A., 1.

WHEELER, R. L., *see* Berger, Philip S., 1, 2.

WHITE, ELIZABETH L.

1. (and Reich, B. M.). Behavior of annual floods in carbonate basins of Pennsylvania [abs.]: National Speleological Society Bulletin, v. 32, no. 2, p. 48–49, 1970.
2. (and Reich, B. M.). Behavior of annual floods in limestone basins in Pennsylvania: Journal of Hydrology, v. 10, no. 2, p. 193–198, 1970. The relationships between flood data and watershed features were examined in small basins. The authors discuss the anomalous behavior of floods in limestone basins, and the important effect that the presence of limestone has on smoothing the flood peak. The open sinkholes accept storm excess and temporarily add to groundwater storage.
3. (and White, W. B.). Quantitative morphology of landforms in carbonate rock basins [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 1167, 1976.
4. Sustained flow in small Appalachian watersheds underlain by carbonate rocks: Journal of Hydrology, v. 32, no. 1–2, p. 71–86, illus., 1977. The groundwater release from storage as it relates to sustained flows in surface streams for 57 carbonate basins within the Appalachian Highlands was examined. Basins having a high degree of karst development have low sustained flow because of poor groundwater storage.
5. (and White, W. B.). Quantitative morphology of landforms in carbonate rock basins in the Appalachian Highlands: Geological Society of America Bulletin, v. 90, no. 4, p. 385–396, illus., 1979. Landform measurements in small drainage basins in the Appalachian karst between Pennsylvania and Alabama are related to the fluvial character and hydrogeologic setting of the basins.

WHITE, GEORGE W.

1. Thickness of Wisconsinan tills in Grand River and Killbuck lobes, northeastern Ohio and northwestern Pennsylvania, *in* Goldthwait, R. P., ed., Till—A symposium: Columbus, Ohio State University Press, p. 149–163, illus., 1971. Thicknesses of the till sheets are documented. The interfaces between till sheets and their environmental implications as pathways for fluid flow are discussed.

WHITE, I. C. (1848–1927)

1. Second Geological Survey of Pennsylvania: The Coal Industry, v. 5, no. 11, p. 475–576, portrait, 1922; v. 5, no. 12, p. 525–526, 1922; v. 6, no. 2, p. 136,

1923; v. 6, no. 3, p. 174, **1923;** v. 6, no. 4, p. 222, **1923;** v. 6, no. 5, p. 264, **1923;** v. 6, no. 6, p. 282, **1923;** v. 6, no. 7, p. 335, **1923;** v. 6, no. 8, p. 362–363, **1923.** Personal reminiscences by White of his early geologic training and work with the Second Geological Survey of Pennsylvania, particularly during the years 1875–1883.

WHITE, J. R., *see* McCulloch, Charles M., 5.

WHITE, MARTHA

1. The geology of the Egypt Mills area, Pike County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1973.**

WHITE, S. H.

1. (and Wilson, C. J. L.). Microstructure of some quartz pressure fringes: Neues Jahrbuch fuer Mineralogie, Abhandlungen, v. 134, no. 1, p. 33–51, illus., **1978** [not seen].

WHITE, WILLIAM B.

1. Geomorphology of Arch Spring and the role of caves in ground-water movement, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 65–68, illus., **1971;** Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 65–68, illus., **1971.** Arch Spring in Blair County, a karst fenester and associated natural bridge, and nearby Tytonna Cave, part of the strike- and bedding-controlled conduit cave system in the area, are described as one of Pennsylvania's most accessible examples of a trunk drain.
2. The Appalachian karst; an overview: International Congress of Speleology, 5th, Stuttgart, West Germany, 1969, Proceedings, v. 1, p. M 13.1–M 13.5, illus., **1974** [not seen].
3. Caves: underground laboratories and underground wilderness: Earth and Mineral Sciences, v. 46, no. 2, p. 9–12, illus., **1976.** An informative introduction to caves, including the mechanisms of their formation and their hydrology and mineralogy. Pennsylvania caves are discussed.
4. (ed.). Geology and biology of Pennsylvania caves: Pennsylvania Geological Survey, 4th ser., General Geology Report 66, 103 p., illus., **1976.** A comprehensive study of the origin of caves, their forms and features, and their animal populations.
5. (ed.). The caves of western Pennsylvania: Pennsylvania Geological Survey, 4th ser., General Geology Report 67, 97 p., illus., **1976.** Details of 79 caves in 12 counties of western Pennsylvania are provided. Cave maps are included.

See also Dayton, Gordon O., 1; Langmuir, Donald, 6; Parizek, Richard R., 10; Rauch, Henry W., 1, 3, 6; Shuster, Evan T., 2, 3, 4, 5; White, Elizabeth L., 3, 5.

WHITTEMORE, DONALD O.

1. Application of a VLF electromagnetometer to hydrogeology, *in* Parizek, R. R., and others, eds., Hydrogeology and geochemistry of folded and faulted carbonate rocks of the central Appalachian type and related land use problems: Geological Society of America and associated societies, Annual Meeting, Washington, D. C., 1971, Guidebook, p. 105–108, illus., **1971;** Pennsylvania State University, College of Earth and Mineral Sciences Experiment Station Circular 82, p. 105–108, illus., **1971.** Traverse lines across strike in carbonate terrain show major cave passages and contacts with shale bedrock.
2. The chemistry and mineralogy of ferric oxyhydroxides precipitated in sulfate solutions: University Park, Pennsylvania State University, Ph.D. thesis, **1973.**

WIEGAND, PETER W.

1. (and Ragland, P. C.). Geochemistry of Mesozoic dolerite dikes from eastern North America: Contributions to Mineralogy and Petrology, v. 29, p. 195–214, illus., **1970.** An attempt to define the main chemical types of dikes, the spatial distribution, and the origin and evolution of the magmas. Much centers on examples from Pennsylvania, where two main quartz-normative chemical types are represented by sills and dikes.

WIESE, R. G., JR.

1. Field trip guide—Appalachian Plateau and Valley and Ridge province, Pennsylvania: National Science Foundation Pre-College Teacher Development Program, Mount Union College, Geology Department, 44 p., illus., **1979.** A very general guide to the geology of portions of the Appalachian Plateaus province, the Valley and Ridge province, and the Triassic basin.

WILLIAMS, DAVID A., *see* Cole, Gary A., 1.

WILLIAMS, DONALD R.

1. Preimpoundment water quality of Raystown Branch Juniata River and six tributary streams, south-central Pennsylvania: U.S. Geological Survey Water-Resources Investigations 76–57, 23 p., illus., **1976.** Information was collected on water quality, bacteria, sediment, and soils, and was used to describe the preimpoundment environmental conditions and to predict physical, chemical, and biological characteristics of the reservoir.
2. Postimpoundment survey of water-quality characteristics of Raystown Lake, Huntingdon and Bedford Counties, Pennsylvania: U.S. Geological Survey, 59 p., **1978** [not seen].

WILLIAMS, EUGENE G.

1. (and Bragonier, W. A., and Swinehart, J. B.). Sedimentation in the Carboniferous of western Pennsylvania: American Association of Stratigraphic Palynologists, Annual Meeting, 2nd, State College, Pa., 1969, Guidebook, 78 p., illus., **1969.** This field trip demonstrates the applicability of the concept of cyclothems in understanding the sedimentology of the Carboniferous of western Pennsylvania. The general discussion is identical to the text in the earlier published guidebook for the 29th Field Conference of Pennsylvania Geologists held in 1964. The trip includes five stops between State College and Curwensville. Each stop is extensively described, and a road log is included.
2. Structural control of high-alumina refractory clays in western Pennsylvania: Earth and Mineral Sciences, v. 41, no. 7, p. 53–54, illus., **1972.** The relationship between regional structure and the distribution of high-alumina clay and other clay types is emphasized.
3. (and Bragonier, W. A.). Factors controlling sedimentation in the Pennsylvanian of western Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 4, no. 2, p. 115, **1972.**
4. (and Holbrook, P., and Lithgow, E. E.). Properties and occurrence of bloating clays and shales in the Pennsylvanian of western Pennsylvania [abs.]: Mining Engineering, v. 25, no. 8, p. 31, **1973.**
5. (and Bragonier, W. A.). Controls of Early Pennsylvanian sedimentation in western Pennsylvania, *in* Briggs, Garrett, ed., Carboniferous of the southeastern United States: Geological Society of America Special Paper 148, p. 135–152, illus., **1974.** Pennsylvanian lithofacies and biofacies in western Pennsylvania are primarily controlled by differential subsidence of the entire coal basin; differential uplift of part of the basin margins; differential subsidence and uplift of subblocks largely

within the basin; and sedimentation on paleotopography developed by differential erosion, sedimentation, and compaction. The authors tried to determine the effect of these factors on sedimentation and the time over which they operate.

6. (and Holbrook, R. R., Lithgow, E. W., and Wilson, B. R.). Properties and occurrence of bloating shales and clays in the Pennsylvanian of western Pennsylvania: Society of Mining Engineers of AIME Transactions, v. 256, p. 237–240, illus., **1974.** The mineralogy and geochemistry of Pennsylvanian shales and underclays were studied to determine their suitability for lightweight aggregate and refractory ladle brick.
7. Compositional variation in Pennsylvanian underclays in northern part of Appalachian basin, Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 232, **1979.**
8. Marine and fresh water fossiliferous beds in the Pottsville and Allegheny Groups of western Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 35–49, illus., **1979** [reprinted from Journal of Paleontology, v. 34, no. 5, p. 908–922, 1960].
9. Palynology and petrography of the Lower Kittanning coal bed in western Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 86–87, illus., **1979.** A very brief discussion of the palynologic and petrographic evidence used in determining the paleoenvironment of the Lower Kittanning coal. It is concluded that the Lower Kittanning is a transgressive coal whose thickness, petrography, and palynology were influenced by differential subsidence and marine transgression.
10. (and Bergenback, R. E., Falla, W. S., and Udagawa, S.). Origin of some Pennsylvanian underclays in western Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 72–85, illus., **1979** [reprinted with minor modifications from Journal of Sedimentary Petrology, v. 38, no. 4, p. 1179–1193, 1968].
11. (and Ferm, J. C.). Sedimentary facies in the lower Allegheny rocks of western Pennsylvania, *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 18–22, illus., **1979** [reprinted from Journal of Sedimentary Petrology, v. 34, no. 3, p. 610–614, 1964].
12. (and Keith, M. L.). Relationship between sulfur in coals and the occurrence of marine roof beds [western Pennsylvania], *in* Ferm, J. C., and others, eds., Carboniferous depositional environments in the Appalachian region: Columbia, S. C., Carolina Coal Group, University of South Carolina Department of Geology, p. 102–109, illus., **1979** [reprinted from Economic Geology, v. 58, no. 5, p. 720–729, 1963].

See also Bragonier, William A., 2; Carey, J. B., 1; Degens, Egon T., 1; Ferm, John C., 8, 9; Holbrook, Philip W., 3; Krajewski, Stephen A., 1, 2, 3, 7; Lowright, Richard H., 1, 3; Rahmanian, Victor D. K., 2; Reidenouer, David R., 2; Swinehart, James B., 1; Weber, Jon N., 1, 2; Williamson, W. O., 2; Wilson, B. R., 2.

WILLIAMS, KENNETH F.

1. (and Reed, L. A.). Appraisal of stream sedimentation in the Susquehanna River basin: U.S. Geological Survey Water-Supply Paper 1532-F, p. F1–F24, illus., **1972.** The authors describe the sediment yields throughout the basin, the variability and characteristics of sediment, the suspended-sediment concentrations, poten-

tial reservoir-sedimentation problems that may occur in the basin, and trends in sediment discharge.

WILLIAMSON, W. O.

1. (and Kennard, F. L.). Clays and shales of Pennsylvania (abstracts of publications and theses to 1970): Pennsylvania State University, College of Earth and Mineral Sciences Special Report 1-71, 24 p. **[1971].**
2. (and Williams, E. G.). Relationships between ceramic properties, mineralogy, and geochemistry of some Pennsylvania clays and shales: Pennsylvania State University, College of Earth and Mineral Sciences Special Report 2-71, 46 p., illus. **[1971].** Structural clay products having higher ceramic-property values are obtained from clays and shales containing poorly crystalline and uncemented micaceous minerals. Chemical and mineralogical analyses are included.

WILLMAN, A. H., *see* Metsger, Robert W., 1.

WILSHUSEN, J. PETER

1. The Phantom: Pennsylvania Geology, v. 7, no. 3, p. 9-11, illus., **1976.** A phantom lake has appeared and disappeared repeatedly in Centre County. A geological explanation is given.
2. Mineral resources in the York area, *in* Branthoover, G. L., field trip chairman, Field trip guidebook—1978 Annual Meeting, Hershey, Penna.: Association of Engineering Geologists, p. 79-87, illus., **1978.** Nonmetallic mineral quarries in York County were visited on this field trip.
3. Environmental geology of the greater York area, York County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Environmental Geology Report 6, scale 1:50,000, 3 sheets, **1979.** A geologic and mineral-resources map, an engineering geology map, and a groundwater map are included. Each has a short text.
4. Geologic hazards in Pennsylvania: Pennsylvania Geological Survey, 4th ser., Educational Series 9, 56 p., illus., **1979.** The most common geologic hazards of Pennsylvania are described, and the places where they are likely to occur are shown. The hazards described include landslides, sinkholes and subsidence, and earthquakes.
5. Landslide encounters: Pennsylvania Geology, v. 10, no. 3, p. 2-5, illus., **1979.** Landslide occurrence is widespread in Pennsylvania, especially in the spring.

See also Inners, Jon D., 7, 8; McGlade, William G., 2, 5; Root, Samuel I., 13.

WILSON, B. R.

1. (and Traverse, Alfred). Further information on the palynological stratigraphy of Devonian-Carboniferous rocks of central Pennsylvania [abs.], *in* American Association of Stratigraphic Palynologists—Proceedings of the Sixth Annual Meeting: Geoscience and Man, v. 11, p. 160, **1975.**
2. (and Traverse, A., and Williams, E. G.). Palynological delineation of the Mississippian-Pennsylvanian unconformity in west-central Pennsylvania [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 233, **1979.**

See also Williams, Eugene G., 6.

WILSON, C. J. L., *see* White, S. H., 1.

WILSON, ELIZABETH D., *see* Wilson, James L., 1.

WILSON, JAMES L.

1. (and Wilson, E. D.). Floodplains and flooding, *in* Freedman, J. L., ed., "Lots" of danger—Property buyer's guide to land hazards of southwestern Pennsylvania: Pittsburgh Geological Society, p. 41–45, illus., **1977.** Methods of identifying flood-prone areas are discussed, along with descriptions of items to examine on a property where flooding problems are suspected.

WILSON, LARRY

1. (and Richards, Robert). Geology of the Millersville-Safe Harbor area [Lancaster County]: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1972.**

WILSON, STANLEY D.

1. (and Marano, David). Performance of Muddy Run embankment, *in* Numakura, Takuji, ed., World dams today '70: Japan Dam Association, Tokyo, p. 393–402, illus., **1970.** A very brief description of the geologic information obtained during site exploration is included in this summary of the engineering study performed at a dam site along the east bank of the Susquehanna River near Holtwood in Lancaster County. The only rock formation encountered was the Wissahickon Schist.
2. (and Marano, David). Performance of Muddy Run embankment—Closure: American Society of Civil Engineers Proceedings, v. 96, Journal of Soil Mechanics and Foundation Division, no. SM1, p. 300–301, illus., **1970** [not seen].

WILTSCHKO, DAVID V.

1. (and Chapple, W. M.). Kinematics of the Plateau folds of Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 6, no. 4, p. 413, **1974.**
2. (and Chapple, W. M.). Flow of weak rocks in Appalachian Plateau folds: American Association of Petroleum Geologists Bulletin, v. 61, no. 5, p. 653–670, illus., **1977.** The authors show how the constraints imposed by a "thin-skinned" model for the origin of folding and the available geologic information can be used to construct and test a model of material transport in Plateau folds.
3. Mechanics of Appalachian Plateau structures: Providence, R. I., Brown University, Ph.D. thesis, **1978.**

WINDOLPH, JOHN F., JR., *see* Coleman, S. Lynn, 1.

WINTERS, DERMOT M.

1. Pittsburgh Red Beds: stratigraphy and slope stability in Allegheny County, Pennsylvania: University of Pittsburgh, M.S. thesis, **1972.**
2. Stability of Pittsburgh red beds slopes in Allegheny County, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 5, no. 2, p. 241, **1973.**

WINTSCH, ROBERT P.

1. A chemical approach to the preferred orientation of mica: Geological Society of America Bulletin, v. 89, no. 12, p. 1715–1718, illus., **1978.** Mechanical rotation and recrystallization are believed to be important mechanisms in producing the preferred orientation of phyllosilicates that defines slaty cleavage. Both of these have been proposed for the development of slaty cleavage in the Martinsburg Formation in eastern Pennsylvania.

WISE, DONALD U.

1. Multiple deformation, geosynclinal transitions and the Martic problem in Pennsylvania, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology:

central and southern: New York, Interscience Publishers, p. 317–333, illus., **1970.** An attempt has been made to synthesize details of this complex structural zone in southeastern Pennsylvania.

WITWER, DAVID, *see* Emrich, Grover H., 3.

WOLD, RICHARD J., *see* Hutchinson, Deborah R., 1.

WOLFE, C. W., *see* Keidel, F. A., 1.

WOLOSZ, THOMAS H.

1. (and Wallace, R. J.). Population variations in colonizing communities of Devonian patch reefs [from Centerfield fossil zone near Stroudsburg] [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 6, p. 1175–1176, **1976.**

WOOD, CHARLES R.

1. (and Flippo, H. N., Jr., Lescinsky, J. B., and Barker, J. L.). Water resources of Lehigh County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 31, 263 p., illus. including geologic map, **1972.** The northern part of the county is underlain by the Martinsburg Formation, the central part by the Leithsville, Allentown, and Jacksonburg Formations and the Beekmantown Group, and the southern part by the Brunswick Formation. Very low well yields are typical of wells in diabase, hornblende gneiss, and Jacksonburg cement rock. Very high yields are more likely in the limestone and dolomite aquifers. Most groundwater is of the calcium bicarbonate type.
2. (and MacLachlan, D. B.). Geology and groundwater resources of northern Berks County, Pennsylvania: Pennsylvania Geological Survey, 4th ser., Water Resource Report 44, 91 p., illus. including geologic map, **1978.** The carbonate rocks that underlie the southern part of the study area are the greatest potential source of groundwater. Records of more than 900 wells were compiled.

WOOD, CYNTHIA

1. A study of fluid inclusions in quartz veins associated with the Octoraro Phyllite in southeastern Pennsylvania: Bryn Mawr, Pa., Bryn Mawr College, M.A. thesis, **1976.**

WOOD, GORDON H., JR.

1. (and Bergin, M. J.). Structural controls of the Anthracite region, Pennsylvania, *in* Fisher, G. W., and others, eds., Studies of Appalachian geology: central and southern: New York, Interscience Publishers, p. 147–160, illus., **1970.** Vectoral resolution of stresses in the Silurian to Pennsylvanian rocks was controlled by five lithotectonic units. This control resulted in the development of characteristic suites of structural features in each unit.
2. Geologic map of anthracite-bearing rocks in the north part of the Orwigsburg quadrangle, Schuylkill County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–689, scale 1:12,000, **1972.** Mississippian to Pennsylvanian rocks (Mauch Chunk, Pottsville, and Llewellyn Formations) were mapped. Structure sections are included.
3. Geologic map of anthracite-bearing rocks in the Pottsville quadrangle, Schuylkill County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I–681, scale 1:12,000, 2 sheets, **1972.** Upper Mississippian and Pennsylvanian rocks (Mauch Chunk, Pottsville, and Llewellyn Formations) were mapped. Structure sections are included.

4. Tectonics of folded Appalachians of Pennsylvania as deduced from Anthracite region [abs.]: American Association of Petroleum Geologists Bulletin, v. 56, no. 10, p. 2111, **1972.**
5. Geologic map of the Orwigsburg quadrangle, Schuylkill County, Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ-1029, scale 1:24,000, **1973.** Bedrock of Ordovician to Pennsylvanian age and alluvium and talus deposits of Quaternary age were mapped. A stratigraphic section and structure sections are included.
6. Geologic map of the Pottsville quadrangle, Schuylkill County, Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ-1028, scale 1:24,000, **1973.** Bedrock of Silurian through Pennsylvanian age and alluvium and talus deposits of Quaternary age were mapped. Structure sections are included.
7. (and Arndt, H. H.). Geologic map of the Delano quadrangle, Schuylkill County, Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ-1054, scale 1:24,000, **1973.** Bedrock of Late Devonian to Late Pennsylvanian age and talus deposits of Quaternary age were mapped. A stratigraphic section and structure sections are included.
8. Geologic map of anthracite-bearing rocks in the southern half of the Delano quadrangle, Schuylkill County, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-737, scale 1:12,000, **1974.** Devonian, Mississippian, and Pennsylvanian units are mapped. Cross sections and columnar sections are shown. Thickness ranges of principal coals are given, along with coal-resource estimates.
9. Geologic map of anthracite-bearing rocks in the Tamaqua quadrangle, Carbon and Schuylkill Counties, Pennsylvania: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-809, scale 1:12,000, 2 sheets, **1974.** Mississippian and Pennsylvanian rocks were mapped. Structure sections and columnar sections are included.
10. Geologic map of the Nesquehoning quadrangle, Carbon and Schuylkill Counties, Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ-1132, scale 1:24,000, **1974.** Bedrock of Ordovician to Pennsylvanian age and alluvium and glacial outwash of Quaternary age were mapped. A stratigraphic section and structure sections are included.
11. Geologic map of the Tamaqua quadrangle, Carbon and Schuylkill Counties, Pennsylvania: U.S. Geological Survey Geologic Quadrangle Map GQ-1133, scale 1:24,000, **1974.** Bedrock of Ordovician to Pennsylvanian age and alluvium of Quaternary age were mapped. A stratigraphic section and structure sections are included.

See also Arndt, Harold H., 3; Hosterman, John W., 1; Medlin, J. H., 1.

WOODROW, DONALD L.

1. (and Fletcher, F. W., and Ahrnsbrak, W. F.). Paleogeography and paleoclimate at the deposition sites of the Devonian Catskill and Old Red facies: Geological Society of America Bulletin, v. 84, no. 9, p. 3051-3063, illus., **1973.** Paleogeographic and paleoclimatologic interpretations applicable to Middle and Late Devonian strata in the central Appalachians are presented.

See also Fletcher, Frank W., 1; King, John, 1.

WOODRUFF, K. D., *see* Jordan, R. R., 1, 2.

WRIGHT, ELLEN K., *see* Stephens, George C., 3; Wright, Thomas O., 5, 10, 11.

WRIGHT, JOHN C., JR.

1. Geochemistry of heavy metals in the C horizon of a sandy loam soil in Pennsylvania: University Park, Pennsylvania State University, M.S. thesis, **1978.**

See also Langmuir, Donald, 8.

WRIGHT, NANCY A.

1. Subsurface Tully Limestone, New York and northern Pennsylvania: New York State Museum and Science Service Map and Chart Series 14, 15 p., 3 pls., **1973.** An isopach map, structure contour map, and correlation sections indicate that the Tully Limestone does not extend west of central McKean County and that, in northwestern Pennsylvania, the Tichenor limestone and an unnamed limestone, both within the Hamilton Group, have been mistaken for the Tully.

WRIGHT, THOMAS O.

1. (and Stephens, G. C.). Structure, age and depositional environment of Shochary Ridge, Martinsburg Formation, Berks and Lehigh Counties, Pennsylvania [abs.]: Geological Society of America Abstracts with Programs, v. 8, no. 2, p. 305, **1976.**
2. (and Caldemeyer, R. D.). Invertebrate fossils from Shochary Ridge, Berks and Lehigh Counties, Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 51, no. 2, p. 153–156, illus., **1977.** The age range of the Shochary Ridge rocks, based on a reinvestigation of the fauna, is discussed.
3. (and Garwood, S. M., and Derstler, Kraig). The age of the Martinsburg Formation at Swatara Gap, Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 51, no. 1, p. 85–87, illus., **1977.** Lithologic and faunal evidence supports the view that the Martinsburg Formation exposed at Swatara Gap is autochthonous and continuous with the central Appalachian-type Martinsburg rocks.
4. (and Stephens, G. C.). Regional implications of the stratigraphy and structure of Shochary Ridge, Berks and Lehigh Counties, Pennsylvania: American Journal of Science, v. 278, no. 7, p. 1000–1017, illus., **1978.** The geology of the Shochary Ridge was reexamined. The stratigraphic and sedimentologic nature of the rocks is described and their age is set, based on fossil evidence.
5. (and Wright, E. K., and Stephens, G. C.). The autochthonous Martinsburg Formation (Ordovician) of eastern Pennsylvania—new evidence for a revised stratigraphy [abs.]: Geological Society of America Abstracts with Programs, v. 10, no. 2, p. 91, **1978.**
6. (and Feeley, Mary). Geochemistry of red and green shales of the Hamburg klippe: Pennsylvania Academy of Science Proceedings, v. 53, no. 2, p. 201–204, illus., **1979.** The color difference between the red and green shales is due primarily to a difference in Fe_2O_3/FeO ratios (high ratios for red and low ratios for green shales). The samples were taken near Hamburg, Berks County.
7. (and Kreps, L. F.). Provenance of the Hamburg klippe and Shochary Ridge, eastern Pennsylvania: Pennsylvania Academy of Science Proceedings, v. 53, no. 1, p. 98–100, illus., **1979.** Petrographic analysis of the Hamburg klippe and Shochary Ridge graywacke indicates that both were derived from an area of primarily continental rocks. The absence of volcanic rock fragments in the very immature graywackes implies that volcanic rocks were not present in the source area.
8. (and Platt, L. B., Gill, Greta, and Stephens, G. C.). Cleavage in Martinsburg shale, a quantitative study of volume loss by pressure solution [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 7, p. 544–545, **1979.**
9. (and Stephens, G. C.). Reply [*to* Regional implications of the stratigraphy and structure of Shochary Ridge, Berks and Lehigh Counties, Pennsylvania]: American Journal of Science, v. 279, no. 6, p. 728–732, **1979.**

10. (and Stephens, G. C., and Wright, E. K.). A revised stratigraphy of the Martinsburg Formation of eastern Pennsylvania and paleogeographic consequences: American Journal of Science, v. 279, no. 10, p. 1176–1186, illus., **1979.** New evidence is presented that allows the authors to redefine the stratigraphy of the Martinsburg Formation in eastern Pennsylvania, separate the allochthonous rocks from autochthonous rocks in the area, resolve the position of Shochary Ridge, and reinterpret the paleogeographic history of the area.
11. (and Stephens, G. C., and Wright, E. K.). Biostratigraphy of the Martinsburg Formation (Ordovician) in eastern Pennsylvania and its contribution to the reconstruction of Taconic events in the central Appalachians [abs.]: Geological Society of America Abstracts with Programs, v. 11, no. 1, p. 60, **1979.**

See also Feeley, Mary H., 1; Gill, Greta, 1; Herting, David A., 1; Kreps, Lorraine F., 1; McStraw, Mike, 1; Stephens, George C., 1, 3.

WYRICK, G. G., *see* Lloyd, Orville B., Jr., 1.

YAWORSKI, MICHAEL

1. (and Rector, Dean, Eckenrode, Joseph, Jensen, Earnest, and Grubb, Robert). Soil survey of Crawford County, Pennsylvania: U.S. Department of Agriculture, Soil Conservation Service, 73 p., illus. including soils maps, **1979.** The various soils present are described, along with factors related to soil formation and soil use. Detailed soils-association maps are included.

YELOUSHAN, CHARLES C.

1. The mineral industry of Pennsylvania in 1968: Pennsylvania Geological Survey, 4th ser., Information Circular 69, 22 p., illus., **1970;** reprinted *from* The mineral industry of Pennsylvania, *in* Area reports: domestic: U.S. Bureau of Mines Minerals Yearbook 1968, v. 3, p. 629–650, illus., **1970.**

YOCHELSON, ELLIS L.

1. Monongahela and Dunkard nonmarine gastropods, *in* Barlow, J. A., and Burkhammer, Susan, eds., Proceedings of the First I. C. White Memorial Symposium [Morgantown, W. Va., 1972]—"The age of the Dunkard": West Virginia Geological and Economic Survey, p. 249–263, illus., **1975.** Only the Little Captina Limestone Member of the Monongahela Group is consistently fossiliferous with nonmarine gastropods. Because of the limited number of species available and the general similarity of all the faunules, the gastropods cannot be used to determine the placement of a systemic boundary in the rocks of the Dunkard basin.

See also Solem, Alan, 1.

YORK, HAROLD F., *see* Thomson, Robert D., 1.

YORKE, THOMAS H.

1. (and Reed, L. A.). Measuring the effectiveness of construction site sediment controls: National Watershed Congress, 25th, Toronto, Ontario, Canada, 1978, p. 132–139, **1978** [not seen].

YOST ASSOCIATES INC.

1. Toby Creek mine drainage pollution abatement project: Pennsylvania Department of Mines and Mineral Industries, Operation Scarlift Project SL 132, variously

paginated, illus. [no date]. This open-file report includes an assessment of the existing conditions of acid mine drainage in the watershed, recommendations for abatement, and respective cost analyses. Mine locations, geochemical analyses of mine drainage, and a brief description of the geology are included.

YOUNG, DAVIS A.

1. Precambrian salic intrusive rocks of the Reading Prong: Geological Society of America Bulletin, v. 89, no. 10, p. 1502–1514, illus., **1978.** Salic intrusive rocks are found in three major areas of the Reading Prong. Each area has distinct characteristics.

YOUNG, KENNETH A.

1. Lewistown Laurel Creek Dam—Geologic related conditions in construction, *in* Faill, R. T., ed., Structure and Silurian-Devonian stratigraphy of the Valley and Ridge province, central Pennsylvania: Annual Field Conference of Pennsylvania Geologists, 38th, Camp Hill, Pa., Guidebook, p. 45–46, **1973.** A summary of the geologic conditions and construction techniques used.

YUILL, CHARLES B., *see* Mentz, John W., 1, 2, 3, 4, 5, 6.

ZAIDI, MOHAMMED, *see* Donaldson, Alan C., 3, 4.

ZAKI, NABIL

1. (and Ryan, J. D.). Heavy minerals in Delaware River sands between Trenton, N. J., and Philadelphia, Pa.: Pennsylvania Academy of Science Proceedings, v. 45, p. 14–15, **1971.** Heavy mineral assemblages from the Delaware and Schuylkill Rivers reflect the local bedrock geology.

ZALEWSKI, SLAVOMIR A., *see* Werner, Matthew L., 1.

ZAMPOGNA, RALPH V.

1. Lithologic analysis and correlation of the Lowville Limestone from selected locations in eastern United States: Indiana, Pa., Indiana University of Pennsylvania, M.S. thesis, **1970.**

ZARTMAN, ROBERT E., *see* Higgins, Michael W., 6.

ZEILINGER, J. E.

1. Preparation characteristics of coal from Beaver and Lawrence Counties, Pa.: U.S. Bureau of Mines Report of Investigations 7324, 23 p., illus., **1969.** Preparation characteristics of the economically significant coal beds of Beaver and Lawrence Counties are given. Five of the total of seven samples tested could be sufficiently upgraded during washability analyses to produce metallurgical-quality products.
2. (and Deurbrouck, A. W.). Preparation characteristics of Pennsylvania anthracite from the Kidney seam, Northern field: U.S. Bureau of Mines Report of Investigations 7364, 19 p., illus., **1970.** Proximate and ultimate analyses of the raw coal are included, along with size analyses and washing characteristics.

ZEISS, HARVEY S.

1. Automated coal petrography at Bethlehem Steel [abs.]: International Congress of Carboniferous Stratigraphy and Geology, 9th, University of Illinois at Urbana-Champaign, Urbana, Ill., 1979, Abstracts of Papers, p. 242, **1979.**

ZEN, E-AN

1. The Taconide zone and the Taconic orogeny in the western part of the northern Appalachian orogen: Geological Society of America Special Paper 135, 72 p., illus., **1972.** This paper contains a description of the geologic features that characterize the Taconides and also a description of the individual geologic terranes. The Martinsburg Formation of southeastern Pennsylvania is discussed.
2. Prehnite- and pumpellyite-bearing mineral assemblages, west side of the Appalachian metamorphic belt, Pennsylvania to Newfoundland: Journal of Petrology, v. 15, pt. 2, p. 197–242, illus., **1974.** The mineralogy and petrography of occurrences of prehnite- and pumpellyite-bearing metamorphic rocks are reported and their petrologic significance interpreted. Geologic implications of these occurrences are briefly discussed. A site near Jonestown, Lebanon County, is reviewed.

ZIEGLER, RICHARD L., *see* Densmore, Neal W., 1.

ZIELINSKI, R. E.

1. (and Dixon, J. A., McIver, R. D., and Hunt, A. E.). Pressure coring of gas-bearing Devonian black shales, Erie County, Pennsylvania [abs.]: American Association of Petroleum Geologists Bulletin, v. 63, no. 9, p. 1592, **1979.**

ZIETZ, ISIDORE, *see* Fisher, George W., 2; Higgins, Michael W., 3; King, Elizabeth R., 1.

ZIMMERMAN, R. A.

1. The interpretation of apatite fission track ages with an application to the study of uplift since the Cretaceous in eastern North America: Philadelphia, University of Pennsylvania, Ph.D. thesis, **1977.**

ZIMMERMAN, R. K., *see* Ferm, John C., 9.

ZIMMERMANN, LISA, *see* Lystrom, David J., 2, 3.

ZINK, GERALD

1. The effectiveness of pillar softening as a roof control method at the Revloc mine, Ebensburg, Pennsylvania: Golden, Colorado School of Mines, M.S. thesis, **1975.**

ZIPF, K., *see* Sumner, John R., 1.

ZOERNER, FREDERICK P.

1. Structure and petrology of the Wagontown area, Chester County, Pennsylvania: Lancaster, Pa., Franklin and Marshall College, Senior thesis, **1970.**

ZVIRBLIS, A. GERALD

1. Great fossil discoveries: the coal flora: Gems and Minerals, no. 498, p. 6–7, 41–43, illus., **1979.** Significant fossil finds include those from Pennsylvania's coals. Short descriptions of the major plant types are included.
2. Great fossil discoveries: the coal flora, Part 2: Gems and Minerals, no. 499, p. 14, 36, 38, 40, illus., **1979.** See annotation in entry 1 above.

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